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**BERLIN MEMORIAL TAPS LMS' CALM PATTERNS™ TO IDENTIFY
SERIOUS FETAL DISTRESS**

With complications in obstetrics on the rise, Berlin Memorial Hospital, based in Wisconsin, sought ways to forecast risk and take preventative measures against birth-related injuries. The hospital's senior management was particularly influenced by an alert from the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO), which sets standards for healthcare organizations and issues accreditation to organizations that meet those standards. JCAHO examined factors associated with perinatal death and permanent disability related to birth injury. The alert identified communication issues to be the root cause occurring in 72% of its cases reviewed. Other root causes included problems with staff competency – 47%, orientating and training process – 40% and inadequate fetal monitoring – 34%. In response to this alert and with 225 births per year, Pam Mork, RNC, Berlin Memorial's Clinical Manager, wanted to enhance the hospital's basic fetal surveillance and introduce an archival system with a tool that could provide more in depth and consistent analysis than their present methodology.

Berlin Memorial, with its 5 monitored beds, 16 L&D nursing staff, and 14 MDs, including 2 OB-GYNs and 12 family practitioners, identified specific challenges to overcome. An internal examination conducted by Berlin Hospital management concluded that: (1) general practitioners in a 50 mile radius needed remote access to monitor infrequent deliveries; (2) communication between nursing and practitioners required improvement; (3) support was needed for nursing and clinical staff on long day and night shifts; (4) educational requirements in fetal tracing analysis needed enhancement; and (5) knowledge and practice gaps related to evolving tracing analysis guidelines and increasing complexity of fetal surveillance protocols needed to be addressed.

After some preliminary testing, Berlin Memorial chose to implement LMS Medical Systems' CALM® Suite for Obstetrics, including CALM Patterns for electronic fetal monitoring (EFM) at the hospital and from individual physician offices. "From the onset, I was impressed by the LMS system's integration and archiving of fetal monitoring strips with the patient's charting. I knew that could make it a valuable remote access tool for our practitioners and our nursing staff in general to improve the quality of care," says Mork.

CALM Patterns is real-time proprietary software that analyzes the fetal heart rate tracing. During labor, Mork and her staff review the tracing looking for patterns that can be indications of fetal distress. The failure to recognize and respond to abnormal fetal heart rate patterns in a timely manner can lead to a number of serious complications for the fetus and can be a cause of brain injury in infants. Birth-related injuries can also result in significant legal and financial judgments against physicians and their hospitals. That's where LMS' CALM Patterns comes in. CALM Patterns uses specialized algorithms and neural networks that detect, label and measure patterns in fetal heart rate tracings during labor for real-time computer analysis. "The CALM Patterns system has increased the confidence of our staff – both experienced and new OB nurses," says Mork. "Like an airplane's autopilot system is to a pilot, CALM Patterns isn't a substitute for an educated nurse professional. However, it is an excellent check on our own internal procedures and quality controls we have in place for each patient."

With a small OB nursing staff and long, demanding work schedules, Mork knows that a thorough check on the system is crucial. Berlin usually staffs with 2 RNs per shift and occasionally 1 RN during the night shift who alone monitors the fetal heart tracings looking for decelerations. Diagnosing why the deceleration – a decrease in the amount of oxygen to the fetus – is occurring and whether it is harmful is of paramount concern. "Is the infant's head or the umbilical cord depressed?" questions Mork. "Is the cause placental insufficiency? These are the questions the nurse is asking herself, often times without the physician present." Moreover, it is under these circumstances, where fatigue, distractions, and inexperience are at issue, that CALM Patterns is particularly beneficial to Berlin's patients. First, nurses can utilize the software to confirm their assessments. "The program also contains a list of prompts and allows nursing staff to choose from a list of annotations so we can build-in the kind of quality-controlled care we require for each patient," says Mork. CALM Patterns facilitates communication using standardized language, based on National Institute for Child Health and Development definitions of EFM patterns. Furthermore, it counters inconsistency and brings uniform standards to the bedside.

Most importantly, when nurses do detect a potentially dangerous combination of patterns, the CALM system allows the physician remotely to see the EFM tracing and pattern analysis in real time. Each hospital, in accord with its clinical staff and liability concerns, customizes the software to meet its own unique criteria. When a fetal heart deceleration triggers certain set parameters, the hospital staff knows that it is time to take decisive action. "It is at that point that the on-duty nurse can decide what to do. If giving the mother IV fluids, changing her position, or administering oxygen doesn't improve the deceleration, the physician is immediately called," explains Mork. In the end, Berlin also has the capability to archive electronically the entire labor and delivery record for each patient, documenting heart rate patterns and procedures should any complications arise – an important aspect for physician and hospital liability purposes.

In using the CALM Suite, Mork has also noticed an increased sense of collaboration between nurses and practitioners. The opportunity has led Berlin Memorial to utilize CALM Patterns' capabilities as a recruitment tool in a field with a high rate of turn-over.

“Generally, it takes five years in one nursing area to become an expert and be able to make clinical assessments in the OB area,” says Mork. “It’s a long time commitment, but this technology enables even new nurses to collaborate with physicians and learn the field in a way they could not have before. We find that a truly valuable aspect here at Berlin, enabling us to recruit and train our nursing staff in a way that exceeds expectations.”

Years before the oximeter became standard practice for anesthesiologists to ensure sufficient oxygen supply to patients during surgery, hospitals and their insurers absorbed the expense of these now unnecessary risks. Today, hospitals like Berlin Memorial, their physicians and obstetrics practices are in a similar situation. New technologies like LMS’ CALM Patterns can offer an effective methodology for enhancing fetal surveillance in ways that provide increased health and safety for patients and enhanced practices for physicians, the nursing staffs and their insurers.