

Fetal Monitoring at Home is Found Effective in Reducing Stillbirths

Nearly 100 babies are stillborn in the United States every day; more than 30,000 each year in the U.S. and 4.5 million worldwide. * Clinically known as Sudden Antenatal Death (S.A.D.) Syndrome, stillbirth is the delivery of a dead fetus after the 20th week of pregnancy. Umbilical Cord Accidents (UCA) account for 20–25% of all stillbirths, or 2–4 deaths/1,000 live births. Studies have shown that pregnancy after stillbirth has a repeat stillbirth risk rate of five- to ten-fold. Home fetal monitoring using web-based patient management software has been successful in helping to prevent UCA-related stillbirth by detecting umbilical cord compression in real time.



Dr. Jason Collins has been researching S.A.D. Syndrome for over a decade. An obstetrician with 20 years of experience, he runs the *Pregnancy Institute* in Slidell, Louisiana, a non-profit organization designed to promote the likelihood of healthier pregnancies resulting in well monitored, full-term, live births. A graduate of Tulane University Medical Center, he is on staff at NorthShore Medical Center in Slidell.

Through his research at the Pregnancy Institute, Dr. Collins has learned that in most cases, fetal death from a UCA does not happen suddenly but occurs over a period of days. During this time, an infant's distress may manifest itself through a change in its heart rate to below 90 beats per minute for greater than one minute. This deceleration is noticed at night, right before the pregnant woman lies down to sleep. At this time she is most relaxed and her heart rate has dropped,

resulting in lowered blood pressure. The change in the baby's heart rate can be detected using an antepartum fetal monitor. Dr. Collins believes that watching for signs of distress during a woman's most restful hours and acting quickly to address them is crucial to preventing stillbirth from UCA.

Home Fetal Monitoring Program

Prevailing thought within the academic community has been that women who have experienced a stillbirth due to UCA have virtually no chance of recurrence simply because the odds would be too great. Recent studies have shown the opposite to be true: women who have lost one or more children to stillbirth have a risk rate that is significantly higher than women who have not. Research from the Pregnancy Institute suggests that a woman who has lost a baby to stillbirth due to an umbilical cord accident is three to five times more likely to

* International Stillbirth Alliance, www.stillbirthalliance.org

suffer the same type of stillbirth in a subsequent pregnancy. The recurrence rate for stillbirth due to something other than UCA is even higher at five- to ten-fold.

Through the Pregnancy Institute, Dr. Collins has developed a unique home monitoring program to help these women overcome the odds. In cooperation with their physicians, Dr. Collins monitors his high-risk mothers-to-be in the last months of their pregnancies—sometimes for as long as six or eight weeks in a row—until the babies are born.

How The Program Works

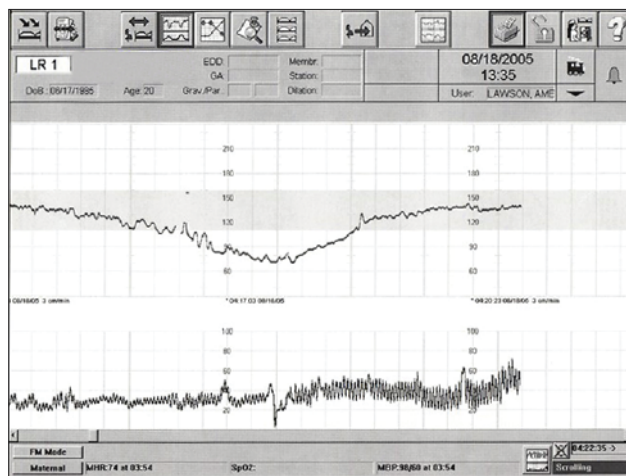
The key to Dr. Collins' program lies in his ability to obtain fetal readings from his patients during their most restful hours, examine the readings within a very short period, and act quickly to address signs of danger. To make this possible, his patients use FETALGARD Lite®—NIBP monitors manufactured by Analogic Corporation (*see upper right*) and patient-management Internet software from e.Care Solutions. Fetal monitors are prescription items not typically available to patients outside the clinical setting, and are made available to women in the program through the Pregnancy Institute.

The patients also have access to e.Care Solutions' web-based patient monitoring and management software, which allows them to take data obtained from the FETALGARD Lite—NIBP and make it available to Dr. Collins remotely via the Internet. In this way, he is able to work with women anywhere in the country. So far, 30 women have participated in the program.

At a predetermined time, typically somewhere between 10 p.m. and 6 a.m., the patient connects herself to the



Analogic monitor, takes a 30-minute fetal reading, then connects the monitor to her home computer. After dialing an e.Care Solutions telephone number, she hits “transfer” and waits for a message that the transfer is 100% complete. The strip is sent through a modem to e.Care Solutions' HIPPA-compliant server and posted



to a secure web site. The patient is able to log on to her private e.Care Solutions web page to look at her readings and see her baby's heartbeat, much the same way she can see her baby's physical image during a sonogram. When e.Care Solutions' server receives the new reading, it automatically sends a text message alert to Dr. Collins (*some doctors choose not to receive*

automatic alerts, but instead check for transfers regularly by logging on to the web site). In addition to receiving automated notifications, Dr. Collins has networked his BlackBerry to the e.Care Solutions server so that when he receives an alert he can access the e.Care Solutions web site from anywhere. Dr. Collins has reviewed readings in a movie theater and while having dinner with his daughter at a restaurant. Each time, he was able to refer his patient to the emergency room in time to deliver a healthy baby.

Of the first 25 women in the program who were part of Dr. Collins' preliminary report, three had emergency C-sections for evolving heart rate changes and 14 had recurrent issues at delivery. All delivered healthy babies. These results led Dr. Collins to conclude: ***"Home fetal heart rate monitoring can detect umbilical cord compression and possibly offer an effective method of identifying the fetus at risk of repeat UCA stillbirth."*** He plans to publish his results after monitoring 100 high-risk pregnancies.

Stillbirth-Associated Umbilical Cord Accident and Subsequent Pregnancy

25 self-referred patients were followed to delivery. Each patient experienced a prior umbilical-cord-associated stillbirth. Prenatal ultrasound was done at 28 weeks to 30 weeks to determine the presence or absence of umbilical cord pathology.

Patient Number	Preg(1)-UCA	Preg(2)U/S 28-30wks	Preg(2)-GA	Preg(2)-Delivery	Preg(2)-UCA
1	SB-NCx2	NCx1	37wks	C/Sect	NCx1
2	SB-NCx2	NCx2/TN	36wks	C/Sect	NCx1-TNx1
3	SB-Velamentous	None	37wks	NSVD	None
4	SB-NCx1	NCx1	37wks	NSVD	NCx1
5	SB-NCx1	NCx1	36wks	NSVD	NCx1/DFM
6	SB-NCx1	NCx1	37wks	NSVD	NCx1
7	SB-NCx1	NCx1	37wks	NSVD	None/DFM
8	SB-Torsion	Torsion	36wks	C/Sect	Torsion
9	SB-TNx1	NCx1	36wks	NSVD	NCx1
10	SB-NCx2	NCx1	37wks	NSVD	None/DFM
11	SB-Torsion	NCx1	37wks	NSVD	None
12	SB-NCx3/TNx1	NCx2	36wks	NSVD	NCx1/DFM
13	SB-Velamentous	NCx1	36wks	NSVD	None
14	SB-NCx1	NCx1	37wks	NSVD	NCx1/DFM
15	SB-TNx1	NCx1	36wks	C/Sect	None
16	SB-Short Cord(SC)	None	36wks	C/Sect	SC
17	SB-NCx2	NCx2	38wks	NSVD	NCx1
18	SB-NCx1	Alx1	36wks	C/Sect	NCx1
19	SB-NCx2	NCx2	36wks	C/Sect	DFM
20	SB-NCx2	Velament	36wks	C/Sect	NCx1/Torsion/Long/Vela/FHR-decel
21	SB-NCx2	NCx1	36wks	NSVD	NC
22	SB-TNx1/NCx1	None	36wks	C/Sect	None
23	SB-NCx2	None	36wks	NSVD	None
24	SB-Torsion /AB	Torsion	37wks	C/Sect	Thin cord/FHRD strip
25	SB AL<BL<LL	NCx3	37wks	NSVD	None

AL = arm loop
BL = body loop
DFM = decreased fetal movement
FHR = fetal heart rate decelerations
LL = leg loop

NC = nuchal cord
NSVD = Normal Spontaneous Vaginal Delivery
SB = stillbirth
SC = short cord
TN = true knot

***The Critical Roles of Analogic
and e.Care Solutions***

Analogic's FETALGARD Lite—NIBP monitor is a prescription device ideal for use at home under medical supervision because it is small, lightweight, and easy to use. It measures maternal blood pressure non-invasively to screen for Pregnancy-Induced Hypertension (PIH) and pre-eclampsia in addition to providing standard fetal monitoring capabilities. An ideal tool for conducting routine Non-Stress Tests (NSTs), the FETALGARD Lite—NIBP can evaluate high-risk, pre-term patients in their homes. In addition to measuring maternal uterine activity and blood pressure, the monitor offers "beat-to-beat" fetal heart rate analysis on twins.

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e.Care Solutions provides home health agencies, hospitals, and physicians with a web-based application for patient monitoring, management, and record keeping that aids in reducing healthcare and operational costs. Remote Care Technology enables monitoring in a low stress, relaxed home environment; supports rapid information flow; and provides mobile accessibility to information at point-of-decision. e.Care Solutions' user-friendly site is hosted in a secure HIPPA-compliant environment.

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