

Chapter Three ~ Ending the Man-made Cesarean Epidemic

There is an effective alternative to the default use of Cesarean as a replacement for normal birth -- a plan that safely reduces medical intervention and surgical delivery while meeting the physical, emotional and psycho-social needs of childbearing women and their unborn and newborn babies. It supplies the missing ingredient by requiring the obstetrical profession to learn, teach and utilize physiological management when providing care to healthy women with normal pregnancies. Unfortunately, there are a number of obstacles to achieving this goal.

One reason that obstetricians are unprepared to provide physiologically-based care for a normal childbirth this is that medical schools do not teach the scientific principles of physiological management. The countervailing belief for the last century is that obstetrical intervention is the best way prevents complications associated with childbirth and that 'failure' to medicalized is negligent care.

For the lay public, the problem is a strong but wrong assumption that normal birth in healthy women is inevitably dangerous for babies and damaging to the pelvic floor. Most people put their faith in the high-tech, high drama variety of obstetrics portrayed in the movies and TV shows such as ER and Gray's Anatomy. This model is tightly focused on continuous electronic fetal monitoring (EFM -- the machine that goes 'ping') and 'just in the nick of time' C-sections to rescue babies.

Whatever beliefs a pregnant woman and her close relatives may have about childbirth, all of them wants what is best for the baby and its mother. We all do. For most Americans, the safe standard for care during labor starts with continuous use of EFM, which is believed to save the baby from brain damage. The frequent use of C-section is assumed to save the mother from 'female troubles'. Under these circumstances, suggesting any reduction or alternative to the current aggressive use of technology and intervention is thought of as pure foolishness. And for the hapless obstetrician who has bravely (or foolishly?) refused to be bullied into systemic over-treatment, his or her 'failure' to use continuous EFM and perform a CS at the drop of a dime can turn out to be a personally devastating and career-destroying decision that the obstetrician will regret for the rest of his life.

But is the EFM-CS model of obstetrics born out by the profession's scientific literature? Does the research actually support the idea that EFM and liberal use of Cesarean surgery eliminates or at least substantially reduces neurological problems in newborns? Nobody wants newborns to come into this world irreparably damaged or to see women in the prime of their life suffer incontinence as a result of childbirth. But is elective Cesarean surgery a reliable method to prevent CP and the pelvic organ problems sometimes associated with childbearing? To everyone's great surprise the obstetrical profession's research says "no" to both of these proposed fixes. More specifically, research also identifies that many routine obstetrical practices actually make matters worse or cause the very complications they are suppose to prevent.

Electronic Fetal Monitoring:

Since 1975 there has been a 6-fold increase in the routine use of EFM on low and

moderate-risk mothers. This reflects the obstetrical profession's long search for something that would dependably eliminate cerebral palsy and other neurological problems for babies associated with birth. Obstetricians fervently believed the expanded use of EFM, combined with cesarean section whenever there was a possible problem, was the modern answer to the ancient and eternal problem of birth-related brain damage. EFM is now the most frequently used medical procedure in the US – out of approximately four million births a year, official estimates are that 85 to 93 percent of all childbearing women are continuously hooked up to EFM equipment during labor. [citation L2M Survey 2002 & 2006; Martin et al 2003] Many health insurance carriers reimburse hospitals at a rate of \$400 an hour for continuous use of EFM during labor, so the expense to consumers and society for such a policy is extraordinary.

However, the consensus of the scientific literature has never supported the routine use EFM on healthy women with normal pregnancies. A 2006 meta-analysis aggregated the data from randomized controlled trials done during the 1980s and 1990s and found *no change* in perinatal mortality or cerebral palsy rate when electronic fetal monitoring was used during labor. This study did identify a significant *increase* in operative deliveries and Cesarean section rates for women who had continuous EFM during labor. The study's only positive finding was a small reduction in neonatal seizures, but this didn't result in any over-all improvement in infant wellbeing.

Another recent study noted that continuous EFM was only able to detected potential cases of cerebral palsy during labor 0.2% of the time. You read that right – 1/5th of one percent. This is not because the electronic circuitry of the EFM equipment is flawed, but because the premise is incorrect – cerebral palsy can neither be reliably detected nor prevented based on the routine use of EFM during labor. Only about 8% of *all* neurological complications for newborns have any possible association with events of labor or birth. Here is what one textbook on electronic fetal monitoring has to say about the predictive value of FHR tracings:

“Chez et al. (2000) noted that EFM technology came to be widely accepted before proof existed of its efficacy and safety. ACOG (2005) noted that the various methods of **intrapartum EFM currently used are not effective in predicting or preventing adverse long-term neurologic outcomes**. They also stated that **management of nonreassuring FHR patterns does not appear to affect the risk of subsequent cerebral palsy**, due to the fact that neurologic abnormalities infrequently result from subtle events occurring during L&D.” [EFM-Concepts and Applications, Menihan & Kopel, 2008; 2nd edition, page 237]

When EFM is routinely used on low and moderate risk populations with normal pregnancies (more than 70% of all laboring women), it introduces unnatural and unnecessary risks. One of the reasons is a consistent difficulty in interpreting fetal monitor information – the ability of the nurse or obstetrician to look at the last 30 minutes of the EFM strip and reliably determine whether or not the fetus is compromised at a level that would justify an emergency C-section and that a Cesarean done at that particular time would reasonably guarantee a baby free from permanent neurological problems. A great many C-sections are done for minor variations in the EFM strip that afterwards were found to be benign – a ‘false positive’. This fact is evident by the normal status of the baby at delivery, who comes out pink and crying, with normal Apgars. When this occurs, the doctors and nurses often comment that “better safe

than sorry”, but childbirth via major surgery is associated with a long list of potential complications and great expense.

The obstetrical professional generally agrees that only about 5% of Cesareans done in the US actually prevent death or major disability for either mother or baby. With a current C-section rate of 32%, that means only 1/6th are functional. No studies on have been able to demonstrate improved perinatal mortality from the use of EFM when it is compared to listening to fetal heart tones every 30 minutes with a hand-held Doppler for low-risk women. This alternative to EFM is called intermittent auscultation. A non-electronic fetoscope or Doppler and specific criteria is used to listen to the unborn baby’s heart rate on a regular schedule.

One researcher (Wood, 2003) has gone so far as to suggest that the inability of continuous EFM to prevent CP and other forms of serious neurological damage, combined with the iatrogenic harm introduced by its use – forced maternal immobility, interpretative errors and increased C-section rate -- is so great that *informed consent should be obtained before continuous EFM is used on healthy women*.

Interpretation of Fetal Monitor Information

One of several technical problems with EFM is the wide variation in the interpretation of FHR tracings, with conflicting opinions and inconsistent finding between different professionals and the same professionals who interpret the same data differently at a later time. The author of the EFM textbook referred to earlier [[EFM-Concepts and Applications, Menihan & Kopel, 2008; 2nd edition, page 29] has observed how the type of data provided by electronic fetal monitoring is dramatically different than other forms of medical equipment used to screen for particular problems. Most medical screening techniques have objective guidelines – a specific set or range of numbers that give clear, yes/no results, or what the military would call “actionable intelligence”.

However, the interpretation of fetal heart rate (FHR) patterns is subjective and depends on the *context* – subtle variations that occur relative to the stage and total length of labor, whether or not the mother was having a contraction and what else was happening, such as the recent placement of an epidural or a mother who was pushing at that time. Interpreting EFM is based on repeated *visual* assessments (pattern recognition) done in hospital L&D rooms by a series of different individuals with various degrees of experience and education. This is a very large window of repeated opportunity for human error.

In addition, care providers who are well trained and proficient in EFM by all objective measures can and do differ greatly in how they interpret FHR tracings. Studies show that obstetricians do not necessarily have greater accuracy in interpreting EFM strips than labor room nurses. When reviewing the same FHR tracing, physicians and nurses often have difficulty in agreeing on an interpretation. Other researchers (Devane and Lalor, 2005) noted that midwives show the same kind of inter and intra-observer variability. These authors concluded that significant difference in the interpretation of EFM data is an intrinsic characteristic of this technology.

This inconsistency is true even for experts in the field of electronic monitoring. One researcher (Cohen *et al.*, 1982) gave 14 different FHR patterns to 12 identified experts. They agreed on 5 FHR tracings, had only fair agreement on 5 others and marked disagreement over the remaining four. Another research team (Nielson and colleagues, 1986) asked four experienced obstetricians to assess 50 thirty-minute-long FHR tracings. Only eleven of the 50 strips were assessed in the same way by all four obstetricians. Even more disturbing is that when they reviewed the same strips two months later, the same obstetricians assessed 20% differently. A 1998 study by Borgatta, *et al* 1988, also had perinatologists review 50 EFM strips. The same perinatologist classified 39 of the 50 differently when asked to re-review those *same* FHR tracings at a later time.

In spite of these well-known problems, the universal use of EFM during normal labor has continued unabated and resulted in a skyrocketing Cesareans section rate that is *not* associated with better outcomes. Unfortunately, the delayed and downstream complications associated with the liberal use of Cesarean surgery makes this policy counterproductive in the extreme.

A current EFM textbook for L&D nurses and midwives notes that: “the greatest misconception about EFM is the belief that it is a *diagnostic* tool. EFM is usefully only as a *screening* tool”. [EFM-Concepts and Applications, Menihan & Kopel, 2nd ed, p. xii, 2008] Except for certain well-recognized emergencies, the value of EFM lies in using the information it provides as a *question about fetal wellbeing* but not as a final answer. More than 90% of fetuses that have a ‘non-reassuring’ FHR patterns are, in fact, healthy. Before EFM data can properly be used as a reason for operative intervention, additional tools and techniques must be used to determine the real significance of the data.

These follow-up methods include fetal scalp stimulation, a simple procedure that can be done easily and instantly by labor room nurse. All she needs to do to rub the unborn baby’s scalp with her finger while doing a vaginal exam. If the baby is adequately oxygenated, scalp stimulation will trigger the fetal heart rate to go up by at least 15 beats above the baseline. With this kind of a ‘reassuring’ sign, no drastic intervention is warranted at that time. If not, a small amount of blood can be taken from small blood vessels on the unborn baby’s scalp and sent to the lab to determine the baby’s wellbeing. However, these additional methods also suffer from serious disagreements between professionals as to proper guidelines for when and how to use them and the validity of the information they provide. Also, some hospitals don’t have the necessary laboratory services to do blood gases if it is at night, a week-end or a holiday. “When in doubt, cut it out” is still the operative obstetrical motto.

In 2003, 1.2 million Cesarean surgeries were performed in the US (27.5% cesarean rate) at a cost of \$14.6 billion. The Cesarean rate for 2006 was over 31%, preliminary report are 32% for 2007. It is predicted to be over 50% by the beginning of the next decade. The public and the press never seem to question the unlikely idea that normal childbirth is somehow made safer and better by turning it into an expensive and risky operation. Yet this policy of ‘pre-emptive strike’ has not made the tiniest bit of difference in the incidence of CP and similar neurological conditions. This verifiable fact is now gratefully *used in malpractice cases in the defense of obstetricians*. Otherwise, the well-recognized inability of EFM to detect or prevent CP has made no difference in the enthusiasm of the public and professionals alike to use continuous EFM on low and moderate risk mothers-to-be.

A failed experiment -- the routine use of continuous EFM

Thirty years of continuous electronic fetal monitoring of all laboring women, combined with the liberal use of cesarean section at the slightest suspicion of fetal distress, has *failed to reduce the rate of cerebral palsy and other neurological disabilities*. This well-documented fact is widely acknowledged in the scientific world. In July of 2003, a report by the *American College of Obstetrician and Gynecologists (ACOG) Task Force on Neonatal Encephalopathy & Cerebral Palsy* stated:

“Since the advent of fetal heart rate monitoring, there has been no change in the incidence of cerebral palsy. ... The majority of newborn brain injury does not occur during labor and delivery. most instances of neonatal encephalopathy and cerebral palsy are attributed to **events that occur prior to the onset of labor.**” [emphasis added]

This ACOG task force report has the endorsement of six major federal agencies and professional organizations, including the CDC, the March of Dimes and the obstetrical profession in Australia, New Zealand and Canada and is widely regarded as the “most extensive peer-reviewed document on the subject published to date”.

The September 15, 2003 edition of *Ob.Gyn.News* stated that:

“The increasing cesarean delivery rate that occurred in conjunction with fetal monitoring has *not* been shown to be associated with *any reduction* in the CP [cerebral palsy] rate... ... Only 0.19% of all those in the study [diagnosed with CP] had a non-reassuring fetal heart rate pattern..... If used for identifying CP risk, a non-reassuring heart rate pattern would have had a **99.8% false positive rate** [N.Engl. J. Med 334[10:613-19, 1996]. The idea that infection might play an important role in [CP] development evolved over the years as it became apparent that in most cases **the condition cannot be linked with the birth process.** ” [emphasis added]

An August 15, 2002 report in *Ob.Gyn.News* stated that:

“Performing cesarean section for abnormal fetal heart rate pattern in an effort to prevent cerebral palsy is likely to *cause as least as many bad outcomes as it prevents*. ... A physician would have to **perform 500 C-sections** for multiple late decelerations or reduced beat-to-beat variability **to prevent a single** case of cerebral palsy.

But since Cesarean section carries a roughly 0.5% risk of future uterine rupture, those 500 C-sections would result on average in **2.5 uterine ruptures**. This in turn would cause **one case of neonatal death** or cerebral palsy.... **So I’ve prevented one case of cerebral palsy and I’ve caused one**, concluded Dr. Hankins, professor and vice chair of ob.gyn at the University of Texas, Galveston.

Moreover, those 500 women who underwent C-section because of an abnormal fetal heart rate pattern face **substantial morbidity related to their surgery**, including a 5 to 10 fold increase in relative risk of infection, a 5-fold increase in [blood clots] as well as

a 10- to **20-fold increase in future risk of placenta previa and accreta**, he added.”
[emphasis added]

*Placenta accreta is when the placenta grows abnormally into the uterus; ‘percreta’ is when it grows through the uterine wall and attaches to the bladder or bowel. These are life threatening complications that frequently require an emergency hysterectomy to stop the bleeding. Percreta has a 7 to 10% maternal mortality rate.

Understanding EFM better and knowing its limitations (move following 2 ½ pages to appendix at end of book?)

It is generally assumed that EFM is the equivalent of an electrocardiogram (EKG) for the unborn baby, with the ability to collect multiple data points and provide definitive diagnostic findings. But that is a serious misunderstanding of the technology.

EFM comes in two basic forms – external and internal. External monitoring uses two wide elastic belts that go around the outside of the mother’s pregnant abdomen. One of these devices uses ultrasound technology to pick up the baby’s heart rate. The other is fitted with a pressure gauge that tracks each uterine contraction (UC), allowing the nurse to note when each contraction begins and ends and track their frequency. External monitoring is simply an electronic mechanism to count the pulse rate of the unborn baby and transpose the acoustic signal of the fetal heart rate into a printed graph and/or a computer display. This makes visible the four auditory markers of fetal wellbeing, which are (1) baseline heart rate, (2) variability, (3) accelerations and (4) absence of *pathological* decelerations.

The normal baseline heart rate for a healthy fetus at term is between 110 and 150 beats per minute (bpm). Rates below 110 are called ‘bradycardia’ (slow heartbeat) and ones over 160 are considered ‘tachycardia’ or fast heartbeat. The hearts of well-oxygenated babies normally have ‘variability’, which is a subtle and on-going change in rate that is seen as tiny ups and downs -- 6 to 25 bpm above and below baseline -- making the EFM strip look like someone is shaking the machine slightly, causing the graph wiggle. Healthy babies also have periodic ‘accelerations’, which is when the heart rate goes up by 15 bpm above baseline for 15 seconds or longer (but less than 2 minutes). Accelerations usually happen naturally a couple (or more) times every hour when the baby moves. However, if the baby is asleep or the mother has been given narcotic drugs or an epidural, accelerations can be absent for up to 90 minutes.

Last but certainly not least, healthy babies usually *don’t* have ‘decelerations’ – a heart rate drop of 15 bpm below baseline, lasting 30 seconds or longer – unless the umbilical cord is getting temporarily tweaked (cord compression) or the head is deep in the mother’s pelvis and getting squeezed hard each time she pushes (head compression). Even then, these decels are only OK as long as the heart rate comes back up to a normal baseline at the end of the UC (or the push) and continues to display adequate variability. Decels are considered pathological if variability is lost (looks like a flat line on the display or print-out), when the decels happen with greater and greater frequency or the FHR drops lower and lower, stays down longer and longer with each decel and fetal scalp stimulations is unable to illicit an acceleration from the baby.

External EFM is technologically vulnerable to errors when the fetal heart rate is very high or very low. When very low numbers (bradycardia) are present, its ultrasound-based mechanism doubles the number and cuts in half the highest ones numbers (tachycardia). Unless the EFM speaker is turned on so the FHR can be heard by the human ear (and someone knowledgeable is in the labor room listening) these technical issues can cause a serious problem with the baby to be missed. With external monitoring, the mother's heart rate can also be mistaken for her unborn baby's. Since adult heart rates are only about half what is normal for fetus, this can cause great alarm when the baby is actually fine. If the mother's heart rate is high, it also can provide a false sense of security when the baby is in trouble.

From the laboring woman's perspective, the other major issue with external monitoring is how maddeningly hard it is to keep the signal. Every time the baby moves or the mother changes position, it provides another chance for the ultrasound beam to lose its target – the walnut-sized fetal heart. The time the nurse spends in the room with the labor patient is often devoted to a nearly constant (and distracting) attempt to get or keep a good signal by adjusting and re-adjusting the placement of the toco (the source of the EFM's ultrasound beam) to line up with the unborn baby's heart. Some mothers have complained that their nurse-midwife spent more time 'midwifing' the monitor than midwifing them.

Internal EFM uses a different and more accurate process to determine the FHR, thus avoiding some of the technical vulnerabilities of the ultrasound-based method. However, internal EFM requires that the amniotic membrane surrounding the unborn baby be ruptured ('breaking the water') and a tiny corkscrew electrode used to puncture the skin and attach itself to the baby's scalp. This sensor directly picks up the electrical signal of the fetal heartbeat. By inserting the fetal heart electrode into the baby's scalp, the electronic signal is not so easily lost when the mother moves around.

However, the baby is deprived of its protective cushion when the waters are broken. As long as the intact membranes contain amniotic fluid, they have what is known as the "hydraulic effect", which uniformly spreads the force of uterine contractions 360 degrees around the uterus and its passenger -- the baby. Once the protective function of the amniotic fluid is lost, each contraction turns the baby's head into a piston being shoved down against the cervix, so that the bones of its cranium become a dilating wedge and must bear the full brunt of the pressure as the baby descends in the pelvis. The loss of the protective amniotic membrane also provides a pathway for infection to ascend up from the vagina into the formally sterile space of the uterus. This is particularly a problem when multiple pelvic exams need to be done to place the internal monitoring equipment in the mother vagina and maintain its connections to the baby's scalp or to place other obstetrical equipment, such as an intrauterine pressure catheter.

Internal monitoring does not have the problem of doubling low rates or half counting high ones and it won't inadvertently pick up the mother's pulse rate as long as the baby is alive. But these improvements come at the price of a very invasive and more expensive system that tethers the mother to her bed and requires her to be relatively immobilized. In spite of its better technology, internal EFM is still not an electrocardiogram (EKG) of the fetal heart. This means it is still restricted to picking up and graphing the same 4 characteristics of the fetal pulse and is subject to most of the same interpretative errors as the less invasive external EFM.

Multiple aspects of both internal and external EFM disturb and frequently disrupt the spontaneous process of labor by restricting or eliminating the mother's ability to walk and move around naturally during labor. Because she spends the vast majority of time in bed lying down, the frequency and severity of stress on the fetus is increased, as is the operative delivery rate for its mother. While the stated purpose of EFM is to reduce the incidence of fetal distress by detecting and correcting problems early on, we find that EFM is oxymoronic to its own reason for being. For healthy women, it often introduces the very problem it was supposed to prevent – fetal distress and the need for emergency surgery.

Intermittent Auscultation ~ a low-tech, cost-effective and safer alternative

In contrast to this expensive, invasive and difficult to use system, listening to the baby's heart tones during labor with a simple fetoscope (a special non-electronic stethoscope) or a hand-held Doppler can provide the same information on the unborn baby's wellbeing. Regularly listening to fetal heart tones at least every 30 minutes in active labor (every 15 minutes if the mother is pushing) with an electronic Doppler for one full minute immediately following a contraction is called *Intermittent Auscultation* or 'IA'. Hospitals often choose not to use IA because it requires continuous one-to-one nursing or nurse-midwifery care, which they consider too expensive. Unfortunately, the nurse or nurse-midwife's time cannot be billed at \$400 an hour, so the hospital loses this 'billable unit' when it does not use continuous EFM. Nonetheless, many parents find the full-time presence of the labor room nurse or nurse-midwife to be an added bonus. IA permits on-going data for the same auditory markers of fetal wellbeing -- normal baseline, normal variability, presence of acceleration, absence of pathological decelerations. Data on FHR patterns can be obtained without the technological and interpretive errors, physical restrictions of the mother's mobility, and the expense and unrealistic expectations associated with the use of continuous EFM.

For low and moderate risk populations, IA is equally as effective as continuous EFM, with the added benefit of a greatly reduced cesarean rate. This is, in part, because it *unhooks* healthy mothers from machines and permits laboring women to move around freely. No longer tethered to the bed by electronic wires, the mother is able to change positions frequently, walk, use hot showers or deep water for pain relief and make "right use of gravity" These practices reduce fetal distress and the need for Pitocin-augmentation of labor, pain medication, anesthesia and instrumental and operative delivery.

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Cesareans not safe or effective for preventing pelvic problems:

Having identified that the 'prophylactic' use of Cesarean is unable to prevent cerebral palsy in babies, elective C-section is often promoted as a prophylactic procedure with the ability to reliably eliminate pelvic floor problems later in the woman's life. However, reputable research also does not support the use of elective Cesarean surgery as either a safe or sure method to

achieve this goal.

In an article entitled “*Elective Cesarean Section: An Acceptable Alternative to Vaginal Delivery?*”, Dr Peter Bernstein, MD, MPH, Associate Professor of Clinical Obstetrics & Gynecology and Women's Health at the Albert Einstein College of Medicine, reported on the failure of the obstetrical profession to practice evidence-based medicine as it applies to this topic. Addressing the popular notion that pelvic floor damage and incontinence were the inevitable result of normal birth (to which cesarean surgery was the proposed remedy), Dr Bernstein observed:

“...these adverse side effects may be more the result of *how* current obstetrics manages the second [pushing] stage of labor. Use of episiotomy and forceps has been demonstrated to be associated with incontinence in numerous studies. Perhaps also vaginal delivery in the dorsal lithotomy position [lying flat on the back] with encouragement from birth attendants to shorten the second stage with the Valsalva maneuver [prolonged breath-holding], as is commonly practiced in developed countries, *contributes significantly* to the problem.”

A guest editorial published in *Ob.Gyn.News*; August 1, 2002 by Dr. Elaine Waetjen debunked the idea that elective cesareans were safe or could reliably prevent the need for pelvic surgery later in life.

“Cesarean surgery causes more maternal morbidity and mortality than vaginal birth. In the short term, C-Section doubles or triples the risk of maternal death, triples the risk for infection, hemorrhage and hysterectomy, increases the risk of serious blood clots 2 to 5 times and causes surgical injury in about 1% of operations.”

In the long term, **cesarean section increases the mother’s risk** of a placenta previa, accreta or percreta, uterine rupture, surgical injury, spontaneous abortions and ectopic pregnancies while decreasing fecundity. Babies delivered by cesarean have a higher risk of lung disorders and operative lacerations.”

Dr Waetjen stated that a: “[physicians] would have to do 23 C-sections to prevent one such surgery.” She ends by commenting that: “... instead of offering elective cesarean in an attempt to prevent future prolapse or incontinence, we should be examining what we can do in our management of vaginal deliveries to protect pelvic floor function”.

Non-physiological pushing styles and positions are risky for mother and baby both -- “purple pushing” during 2nd stage labor damaging to the soft tissue of the birth canal; study confirms that traditional upright positions provide the most room for baby to be born normally:

Another report in published in *Ob.Gyn.News*, March 15, 2003, councils against “purple pushing”. This describes a common practice in medicalized birth when the mother is directed to hold her breath and push so long that she temporarily uses up all her oxygen and gets purple in the face. Prolonged pushing of this type can cause tiny blood vessels [capillaries] in the mother’s face to break and sometimes surface blood vessels in her eyes will rupture, leaving a telltale bright red

spot, similar to the damage that accompanies a black eye. Purple pushing is result of using the Valsalva maneuver, a combination of prolonged breath-holding and “closed-glottis” pushing.

The Ob.Gyn.News article is a synopsis of research done by Lisa Miller, CNM, JD, a former labor and delivery nurse, a nurse-midwife and also an attorney. She identified the general idea of ‘directed’ pushing as an undesirable practice that interferes with normal physiology. Directed pushing usually means the mother is being coached by the labor room nurse or doctor to hold her breath to a count of ten and push as long and hard as possible during each contraction. This is the familiar scene in the movies that show the mother lying in bed on her back, while her husband helps by holding her legs up in the air. With every uterine contraction, the hospital staff exhorts the laboring women to push “harder, harder, harder, hold it, hold it, now come on, give it all you’ve got, one more push, come on, just a little longer, we can see a little bit of the baby’s head, don’t waste your contraction” etc, etc, etc until the mother is out of breath and purple in the face. This style of ‘shout it out’ pushing is biologically unnecessary and counterproductive for several reasons.

The hospital’s coaching policy assumes the mother’s natural biological urge to push is somehow inadequate or that she wouldn’t know how and therefore labor attendants must instruct the mother to hold her breath and push while someone counts to ten and this ritual must be repeated three times for each contraction. Purple pushing is uncomfortable, undignified, and, when contrasted with the ‘right use of gravity’, usually counterproductive. It is not recommended by evidence-based studies because it (a) it doesn’t work as well and (b) it disturbs the oxygen-carbon dioxide balance and causes a dangerous rise in the mother’s blood pressure.

Most regrettably, this form of coached, ‘shout it out’ pushing is perceived by laboring women as an unspoken criticism, that somehow she isn’t doing it quite right or isn’t really trying *hard* enough. Even more disturbing is the anxiety it introduces, which gives everybody in the room the idea that either childbirth is a race with a big prize at the end for the fastest birth *or* the baby is in deep do-do and the staff is trying to get it out before they have to do a crash C-section. Neither is true for 99.99% of healthy women.

Ms. Miller states that:

“Long Valsalva's maneuvers -- or “purple pushing” --- and standard supine [i.e. lying on one's back] positioning should be reconsidered.

Long Valsalva pushing can adversely affect maternal hemodynamics, which in turn *adversely* affects fetal oxygenation

Purple pushing--or closed-glottis pushing--during which the patient holds her breath for 10 seconds while pushing is safe in the approximately 80% of low-risk pregnancies. But that **doesn't mean it works best ... in high-risk cases, the baby can't tolerate that kind of pushing.**

....near-infrared spectroscopy used to evaluate fetal effects revealed that closed glottis and coached pushing efforts led to *decreased* mean cerebral O₂ saturation and increased

mean cerebral blood volume. All Apgar scores were below 7 at one minute and below nine at five minutes. [i.e. sub-optimal Apgar scores indicating a transient stress for the newborn]

Open-glottis pushing, on the other hand, allows the patient to exhale while bearing down and leads to minimal increase in maternal blood pressure and intra-thoracic pressure, maintained blood flow, and decreased fetal hypoxia.”

Right and wrong use of gravity:

At a meeting of the Radiological Society of North America, two radiologists from the University Hospital, Zurich, Switzerland described a pelvimetry study using magnetic resonance imaging (MR) to determine which maternal positions provided the most room for the baby to be born.

The study contrasted the conventional supine position (mother lying flat on her back) to positions in which the mother was squatting or on all-fours, in a ‘hands and knees’ position. A report on their presentation, aptly entitled “**Upright Positions Offer Most Room for Delivery**”, was published in *Ob.Gyn.News* [2002;Volume 37 • No 3]. They measured the space available for the baby to pass through at the three critical landmarks of the childbearing pelvis –intertuberous diameter, interspinous diameters, and the sagittal outlet. They discovered that upright positions provided an average of slightly more than a centimeter at *each* of these junctions.

“Upright birthing positions *provide significantly more room for delivery* in terms of pelvic dimensions, compared with lying supine [on her back], Dr. Thomas Keller said. He and his colleagues ...performed MR pelvimetry on 35 non-pregnant women to compare pelvic bony dimensions in the supine, hand-to-knee, and squatting positions.

These differences are statistically **significant and confirm the advantages of birthing positions long practiced in other cultures**, the study's coauthor Dr. Rahel Kubik-Huch noted during an interview. [emphasis added]

... the theoretical ideal would thus be to adopt the hands and knees position to help the presenting part through the interspinous diameter, and to squat rather than remain supine as the it [the head] traverses the sagittal outlet, said Dr. Kubik-Huch.”

This silly little centimeter of extra space between lying down and being upright can easily be the difference between a spontaneous vaginal birth with a healthy baby and a difficult one that requires unusually long and hard pushing, the use of forceps or vacuum to extract the baby or even a Cesarean section. Any of these mechanically unnecessary interventions may leave both mother and baby in need of prolonged hospitalization or specialized care after the birth. It turns out that the ‘right use of gravity’ during the 1st and 2nd stage of labor is the best way facilitate a normal birth. By avoiding the use of obstetrical forceps or vacuum extraction, the soft-tissue of the mother’s pelvis and the unborn baby’s brain are protected from the damage associated with either prolonged pushing or instrumental deliveries.

Judging a System by its Results

Ultimately, a maternity care system is judged by its results -- the number of mothers and babies who graduate from its ministrations as healthy, or healthier, than when they started. Medicalizing healthy women makes normal childbirth unnecessarily and artificially dangerous and is unproductively expensive. It is obvious that our current system of routine obstetrical intervention for healthy women must be reevaluated and reformed.

So many of the problems we face in the 21st century have defied our best efforts – terrorism, global warming, affordable healthcare for baby boomers, autism, etc. Unlike these many insoluble and often tragic dilemmas, appropriate maternity care is very different. It doesn't take a rocket scientist to stop the inappropriate medicalization of normal childbirth. When one finds oneself in a hole, the first thing to do is to quit digging! The scientific literature clearly demonstrates that physiological management is the safer and most cost-effective form of care for a healthy population. Efforts to rehabilitate our maternity care system must start by listening to childbearing women and their families as a class of *experts in the maternity experience*. Because physiological management has never been a part of obstetrical education in the US, the second thing is for medical educators to learn and teach the principles of physiological management to med students.

A newly formulated national maternity care policy would integrate physiological principles with the *best advances in obstetrical medicine* to create a single, evidence-based standard for all healthy women to be used in all locations by all birth attendants when providing care to healthy women with normal pregnancies. Only then will family practice physicians, obstetricians and professional midwives enjoy a mutually respectful and non-controversial relationship with the obstetrical profession. Under this logical system, the appropriate form of care for any individual mother-to-be (physiological vs. medical) would be determined by the *health status of the childbearing woman and her unborn baby*, in conjunction with the mother's stated preferences, rather than by the *occupational status of the care provider* (physician, obstetrician, midwife).

At present, *who* the woman seeks care *from* (physician/obstetrician vs. midwife) determines *how* she is cared for – physiological management versus maximum medicalization. This is illogical, irrational and unscientific in the extreme. Nowhere else in modern medicine would we tolerate the scientific foundation of our healthcare to be altered, ignored or up-ended based on the professional category of the caregiver. Physiological management is the evidence-based model of care used worldwide for healthy women. Like the laws of gravity, the immutable laws of biology apply internationally and not suspended simply because one is going to give birth within the United States.

The second category of 'fix' is linguistic. For many centuries, the normal non-medical, non-surgical care of pregnancy and normal birth was simply known as 'maternity' care. The origin of the word 'maternity' is 'maternal' and describes care organized around the needs of the mother and her strong concern and desire to protect her unborn or newborn baby. One small step towards a more functional system would be for everyone (professionals and lay public alike) to use the term 'maternity' instead of 'obstetrical' when referring to care provided to healthy women. This simple correction would help everyone realize that normal childbearing is primarily about the

mother and baby -- not about the *professions* or *professionals* that provide support during this biological process. Fine-tuning our language also honors the important contribution of the obstetrical profession when things don't go as planned and sophisticated obstetrical interventions are needed to bring about a good outcome.

Last but not least, we must change the criteria used to determine reimbursement rates for professional childbirth services. It's inappropriate to use a *surgical billing code* for normal spontaneous childbirth, which is the customary method set in stone in the 1930s when reimbursement of medical professionals by third parties (i.e., health insurance companies) was first negotiated into the US. A specific billing code must be configured for physiologically-based care which encompasses the entire intrapartum period as a single continuum of care. This would fairly reimburse professional birth attendants for the considerable time it takes to support the normal process of labor, birth and the immediate postpartum/neonatal period.

Prevention must be valued equally with intervention, and prioritized as the proper role of the professional maternity care provider. Methods that reduce the need for medical interventions and surgical procedures benefit the childbearing woman and her family, third party payers, the economy, the environment and the goals of a humane society.

The final question is simply this: *How much longer will we be content to use an expensive, pathologically-oriented and outmoded 19th century system for our healthy 21st century population?*