

Consequences of Discontinuing Rural Hospital Obstetric Services

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The closing of the Labor and Delivery unit at Bryan W. Whitfield Memorial Hospital in Demopolis, AL while sudden in nature, follows in trend with many other obstetrical unit closures across the United States, driven by falling revenues and decreased federal funding. From 1985 to 2000, the number of hospitals that provided obstetrical services dropped by 23 percent (1). As a result, more than one-third of counties in the United States lacked hospital-based obstetric services in 2000, significantly more than the one-fifth of counties without hospital-based obstetric services in 1985, but the number of babies being delivered is not decreasing with more than half a million babies being born each year in rural hospitals (2). What are the consequences of taking hospital maternity services out of rural communities? The most obvious consequence is lack of prenatal care. Out of the 67 counties in the state of Alabama, 55 of these are considered rural. Only 17 of these rural communities have hospitals where a woman can deliver a baby. This is a steep decrease from 1980, when 46 of these counties offered labor and delivery services. 2, 031,229 people in Alabama live in a designated rural area. Marengo County is one of these rural counties in the state of Alabama. As of 2015, it had a population of 20,028 people of which 53.2% are women (3). Of the people living in Marengo County 25.6% are considered to be living in poverty. On February 28, 2014 Bryan W. Whitfield Memorial Hospital closed its labor and delivery unit. According to the hospital CEO, the closure was due to the loss of almost \$900,000 in federal and state funding, and the Labor and Delivery unit only being reimbursed \$400,000 a year by Medicaid for providing labor and delivery services, when it was spending \$1 million. Also cited was lack of staffing, difficulty in keeping staff such as 24 hour anesthesia coverage, low delivery numbers and again lack of funding.

There was a board suggestion of a 1% sales tax increase to fund a Women's Pavilion to provide obstetrics and gynecological services but this was voted down. Labor and delivery closures are often seen as necessary "cost savers" because of declining reimbursements, rural hospitals typically experience higher Medicaid covered patient populations. Klein et al emphasizes that "cost savings" may prove elusive because the decision to close hospitals in smaller communities carries with it health and economic risks (4). Some 53% of Alabama's obstetrical patients use Medicaid as the only source of coverage. In Marengo county this number is higher at 61% of Medicaid covered births. Low Medicaid reimbursement for obstetrical services could be financially detrimental for hospitals that serve a high proportion of Medicaid patients. Under the current environment, in which reductions in Medicaid spending are expected in many states, rural hospitals may find it even more difficult to remain financially viable if Medicaid patients constitute a high proportion of their patient pools.

Bryan W. Whitfield Memorial Hospital has served its community delivering babies for more than 50 years. But the numbers have decreased over recent years, with 369 deliveries in 2007 to 245 in 2013, to 231 in 2014. It is essential to note that the level of local maternity services (pre- and postnatal only, primary maternity care, maternity care supported by family physicians with Enhanced Surgical Skills (FPSS), mixed FPSS-Specialist models or models supported only

by specialists) must correspond to population need. This can be determined by calculating the average number of births in a community, the vulnerability of the community and distance to the next cesarean section provider (5). While delivery numbers at Bryan W. Whitfield Memorial Hospital are lower, they are not at zero meaning that women still want to deliver at their local community hospital. With the closure, that means that expectant mothers in Demopolis, the largest city in Marengo County, now must travel an hour and eighteen minutes or ride in ambulance 66.5 miles or longer to deliver at DCH Regional Medical Center in Tuscaloosa, 48 miles or 50 minutes to reach Vaughn Regional Medical Center in Selma, or finally go 55.5 miles or 58 minutes to Rush Foundation Hospital in Meridian, Miss. In 2011 a study done by the University of Alabama Institute for Rural Health Research showed that the timed responses of ambulance services in three public health areas, found that rural Alabamians are at a disadvantage for receiving treatment in the event of an emergency. The average call to arrival time was 19 minutes and 8 seconds in the rural areas which is over 27 percent greater than the response in urban counties (6).

A recent Canadian paper looked at outcomes of over 150,000 rural births in the provinces of B.C., Alberta and Nova Scotia from the years 2003 to 2008. Data was reported for eight care models: no local care (>4 hours to care; 2-4hours to care; 1-2 hours to care), primary only care (with access to surgical services greater than one hour away) and various surgical-supported models including specialist care. Controlling for maternal age, parity and pregnancy complications, those communities without any local care showed the highest rates of perinatal mortality and prematurity (<37 weeks) (7). The 2012 updates to the Joint Position Paper on Rural Maternity Care advocated, as it did in 1998, that high-quality maternity care should be available as close to home as possible (8). There is often a false assumption that every patient has access to reliable transportation. However many women lack public transportation in their area. Taxis while universally available in urban areas, would be prohibitively expensive in rural areas even if they were available. Women who live 1 to 2 hours away from services are more likely to remain at home until the onset of labor particularly if they have other children at home and are more likely to deliver en route to the hospital. During a prenatal visit, a patient in my clinic from Demopolis expressed this sentiment.

“I’m just scared. I am going to have to pull over to the side
of the road, and deliver this baby in the back seat”

When the local Labor and Delivery unit is closed, a woman may have to drive herself while laboring, down dark and dangerous roads, hoping to make it in time. Travel on rural roads is inherently dangerous, there are few gas or breakdown recovery services and mobile phone coverage is often non-existent (9). The mobile vehicle accident mortality rate for 2005-2007 for rural Alabama residents was nearly 46 percent higher than that for urban county residents and was more than double the rate for the nation (10). This fear of delivering in the car en route, has happened recently. In April 2016 a 23 year old G3P3003 at 39 1/7 weeks was brought to DCH Regional Medical Center after delivering in her car. In 2014, the same patient delivered precipitously in the bed after ambulance transfer from Demopolis. For women with parity > 3 and more than 45km from care were found to be over six times more likely than women with

lower parity within 5km of maternity service to experience Accidental out of Hospital Delivery (11). Patients with complications who may need weekly or bi-weekly fetal testing may spend an astronomical amount of time driving. Perinatal mortality is significantly higher among out-of-hospital deliveries, and those newborns are significantly more likely to be small for gestational age as compared to newborns with in-hospital births (12). Depending on how far women live from maternity care services, they can experience either more unplanned out-of-hospital deliveries, or once arriving to outlying hospital centers are also subject to increased rates of inductions for logistical reasons which has a direct effect on increased cesarean section rates. The danger of Accidental out of Hospital Births is considerable. In Finland, the crude risk factor for perinatal death is six times higher among babies born accidentally out of hospital (13).

The time to delivery not only affects the laboring patient but also their doctors. If unable to leave the area i.e. Demopolis because of bad weather or because patients present too far along in labor means that doctor is unable to be there for the patient's delivery, and they not only lose revenue for delivery but miss a pivotal moment in their patients' lives. From a financial standpoint distant deliveries can mean cancelling an entire day of clinics as well as having an impact on a physician's ability to maintain personal time. Birth and death are connections that have great meaning to one's life, many family physicians who practice obstetrics do so with the mantra "From the womb to the tomb", and want to be present for their patients delivery. The difficulties faced in providing obstetrical care may be substantial but you will find providers in small towns who work tirelessly to provide excellent, safe birthing experiences to mothers regardless of the distance they may have to travel. Personalized care is often more likely in rural area because of overlapping social networks in small communities (14). As one mother explained [Doctors] are not going to treat you awful in the hospital because nine times out of ten they're going to see you in the street (15).

Since some obstetrical procedures used during complicated deliveries to manage postpartum maternal issues and newborn care can only be carried out in a hospital setting, lack of access to hospital-based obstetric services could have serious implications for the health outcomes of newborns and their mothers. The number of infant deaths in Alabama in 2014 was 517 with rate of mortality being 8.7 per 1000 live births, with 14.6% of this mortality taking place for African American infants (10). This is a stark increase from the overall infant mortality rate across the United States being 5.8 per 1000 live births (9). In 2014, 11.7 percent of the births that took place were at gestational age less than 37 weeks, and in Marengo County only 82 women out of the 245 that delivered at Bryan Whitfield Hospital had what was considered adequate prenatal care (10). Women who travel further for maternity services have worse outcomes, including higher rates of infant mortality and admission to neonatal intensive care units (14). Women in rural areas suffer poorer health outcomes as a whole, and usually have limited access to healthcare, so the closure of Bryan Whitfield Hospital essentially will have a further effect on those numbers.

Davis Larimore looked at the "Relationship of infant mortality to availability of care in rural Florida" in a study published in 1995 and found an increase in perinatal mortality associated with the loss of maternity care providers in rural Florida and found a 9% increase was

associated with the loss of local specialist obstetrical care (17). Perinatal mortality was significantly higher among out-of-hospital deliveries, and those newborns were significantly more likely to be small for gestational age as compared to newborns with in-hospital births (7). A study in rural Missouri examining outcomes for pregnancies from seven rural communities (<10,000 people, >40 miles from metropolitan center) after the closure of maternity services showed an average 18.2% increase in low birth weight infants in the year following closure (18). Further, the rate of admission to tier-three neonatal intensive care units (NICU-3; high acuity) were 50% higher among women with no local care (6 per 1,000 compared to 4 among those with primary care access and 4 among those with local specialist care) and the average number of NICU-3 days were double (71 without local services to 35 with local primary services). NICU-2 (low acuity) admission and days in care were higher for both those with local primary care and those without any local care, likely reflecting the impact of distance to services, outflow and evacuation (19).

The closure of Labor and Delivery units can also have other wide ranging effects-- whether it be influencing the safety of deliveries, the out-of-pocket expenses families must shoulder for childcare services, the decreased attractiveness of a community to young couples and the retention of physicians in smaller hospitals. Outside of the financial implications of having to travel to give birth are the social and psychological costs, during what should be a joyful period in a woman's life. Women may feel overwhelmed with the idea that they may not make it to delivering hospital in time, have anxiety separation from older children, family, and friends who cannot travel with them to referral community and worries about who will care for other children left at home when delivering. A study done in June 2005 by Kornelsen & Grzybowski that looked at the psychosocial impacts of removing maternity care from a community, found that mothers who were unable to travel with their children spoke of the stress of being separated from them for a long time, as well as the stress their children experienced due to the separation (20):

“One girl, she was in grade six or seven, her mother had recently had a baby, and she came to school and she was feeling really sad. She started crying and her teacher didn't know why. She didn't realize that her mom had left to have the baby. And I told the teacher, ‘Ask her if she is lonely for her mom, because her mom went down to have the baby,’ and the teacher said, ‘I hadn't realized that.’

Feelings of isolation and loss of control are argued to result in loneliness, worry, anxiety, loss of appetite and increased smoking in women, while creating disruption in the lives of other family members as well (21). Research has found that many years later, women's memories in childbirth are still accurate and strikingly vivid about maternity care that they experienced (22). Recent evidence examining the psychological experience of pregnancy in rural communities has documented a 7 times greater likelihood of increased stress for women who have to travel more than one hour to access maternity services (20). Importantly, worsened psycho-social and clinical outcomes are not the only consequences of unmet maternity care needs. When circumstances (either personal or health system circumstances) challenged women's ability to

give birth in their home community in a mode that fit their values, they employed strategies to assert their priorities. These strategies included elective induction, seasonal timing of pregnancy to best avoid inclement weather, presenting at the local hospital too late in labor to be transported to a referral community and having an unassisted home birth authors offer an explanation of this choice by calling it 'reactance' – or the “motivational state aimed at recapturing the [perceived loss of] freedom.” (23).

Many patients have their first contact with a hospital through the Labor and Delivery Unit and this contact can provide an opportunity to develop a long standing relationship. Women being the primary medical decision makers for not only themselves and their children may often times be responsible for elderly parents and relatives, and by bringing these women into the system for their delivery can result in revenue for other services used by their family members. Hospital executives recognize that maternity care services provide a point of entry for patients, and that patients may be loyal to hospitals at which they had a good maternity experience (24). The loss of maternity care services, actually causes a trickledown effect that is usually unseen at its closure. Health care providers and nurses, no longer delivering babies suffer the loss of skill sets related to providing obstetrical care and may stop providing women's health altogether. The absence of maternity services, and other vital aspects of women's health care, such as prevention, counseling, birth control counseling and office gynecology are also lost when local obstetricians and family practice doctors move their practices away from the hospital that closed maternity services, the lack of primary care often translates into poor birth outcomes.

Doctors are not there to counsel patients, and to provide education about getting hypertension and diabetes under control and refining health goals prior to becoming pregnant. This lack of education and comorbidities play a role in pre-eclampsia, worsening chronic hypertension and diabetes. The United States Department of Health and Human Services (DHHS), Healthy People 2020 states the risk of maternal and infant mortality in addition to pregnancy related complications can be reduced by increasing access to quality preconception (before pregnancy) and interconception (between pregnancies) care (1). Women from communities with any form of maternity care showed lower rates of prematurity, lower rates of admission to high acuity NICUs and shorter stays in high-acuity NICUs (7).

Existing residents of the community may move away because of the lack of local health care services. In addition, the local hospital being an important employer, is sometimes the largest employer in a small community. Its downgrading or closure has a significant impact on the socio-economic vitality of the community. Bryan Whitfield employs 350 people, with its closing of Labor and Delivery and subsequent employee cuts, 5 to 10 percent of the hospital's staff are said to have been in danger of being laid off. Businesses find it difficult to recruit employees to communities where medical services are limited. Patients are more likely to bypass the nearest hospital when the hospital eventually closed its obstetrics service. This suggests that hospitals that eventually closed their Labor and Delivery units faced greater bypass rates than hospitals that kept their services open (24).

The disproportionately higher concentration of physicians in metropolitan areas has continued despite federal financial policies and incentives aimed to attract more physicians to rural areas. The local supply of family physicians that provide obstetrical care matters. The issue of rural maternity care continues to be problematic, and hospitals that are reduce family physician privileges in rural areas, are making this problem worse. In 2013 in the *American Journal of Clinical Medicine* a study looking at outcomes of 26,331 infants delivered by Obstetrics Fellowship Trained Family Physicians and Obstetricians found Obstetrics fellowship trained Family Physicians and Obstetrician/Gynecologists have comparable neonatal outcomes including respiratory distress syndrome, transient tachypnea of the newborn, birth trauma, fractured clavicle, Erb's Palsy, neonatal death, cephalohematoma, pneumothorax and seizure (25).

The question now becomes not only what happens when rural hospitals close labor and delivery units but how can family physicians and maternity care professionals meet these ongoing challenges? Hospitals with lower birth volume (<240 births per year) are more likely to have family physicians & general surgeons attending deliveries, while those with a higher volume more frequently have obstetricians and midwives attending deliveries (2). In Canada, a study by Black and Fyfe, sought to examine whether safe care was being provided by obstetric units with low volumes and without some of the conditions suggested as ideal at the time. These conditions included 24-hour availability of cross-matched blood, 24-hour laboratory and radiology services, and the availability of anesthesia and cesarean section within 30 minutes. The primary finding of this study was that neonatal loss (including stillbirth, early and late neonatal mortality) was not significantly different between levels of local service (26). Kriebel and Pitts documented low levels of intervention, complications, infant mortality and good Apgar scores from eight years of data (1,026 births) at a three-doctor, 25-bed hospital in Forks, Washington (27).

Family Medicine residents must continue to be competent in supporting uncomplicated vaginal deliveries and seek opportunities for additional training in enhanced skills, including cesarean section, as provided by programs like the Family Medicine Obstetrics Fellowship at the University of Alabama. The more thorough the initial learning and the more overlearning (repetition past the point of having learned the skill) that occurs, the more resistant to forgetting the skill appears to be (28). Family Physicians who acquire enhanced skills in maternity care should be recognized and supported by national organizations and accrediting bodies and hospitals. There is evidence that use of rural training sites for obstetrics during residency encourages rural and obstetrical practice after graduation (16). The more time and exposure spent in rural areas, the more likely a residency graduate is to go into rural practice (15). Rural training sites could include practice areas of former fellows of University of Alabama Obstetrics Fellowship, graduates can be used as preceptors to train future family practice doctors in advanced obstetrics. Knowing that birth is unpredictable and some women will invariably be unable to be transferred due to fetal instability or other issues such as abruption, having well trained family physicians in rural areas allows these areas to deal with these problems when they do arise. Research evidence shows that family practitioners who have acquired competence in caesarean section can maintain their skills with relatively few (5–22)

cases (29). Continued collaboration between graduates and fellowship program could include a graduate continuing to record and maintain logs of deliveries and review these with training institution on a three to five year basis, maintain ongoing educational enhancement.

The overall decline in provision of maternity care by Family Physicians and how to best structure residency training to prepare family physicians to provide these services has been debated by clinicians, professional associations and residency programs for some time (30). A bipartisan bill introduced into Congress would require the Federal Government to designate maternity care health professional shortage areas. The National Health Services Corps gives scholarships and provides loan repayment to primary care providers who commit to servicing for two to three years in designated shortage areas (24). The hope is that once physicians move into a community that they will put down roots, and stay there. Collaborative models of maternity care have the potential to offer rural women the quality of care they are seeking. In order to make local care a certainty, such models should incorporate not only family physicians, obstetricians/gynecologists and nurses but also the specialists and emergency personnel who provide the backup needed for the other practitioners to attend local births with regular confidence (14). Further possible solutions may include telehealth with Maternal Fetal Medicine, simulation training, inter-professional education, preparing clinicians for rural obstetric practice and maintaining skills in low birth volume settings (2). Developing and piloting a rural obstetrics telehealth program in association with larger institutions' Maternal Fetal Medicine service, would allow their trainees to use a new technology while providing support to family practice physicians in small or remote facilities. Training including on site programs to handle obstetric emergencies, should be provided annually to those providing obstetrical care in rural areas. Making sure insurance demands on those rural service providers should also be monitored to ensure that cost does not become a disincentive to practice obstetrics. It is also important to offer perks that incentivize family practice obstetrics providers such as student loan forgiveness, housing allowances, covering vacation time, guaranteed salary, and support for opening new practices in rural areas.

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