Preventing Stillbirths

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Slides 2 – 72:
Preventing Stillbirths

Slides 73 – 108
Count the Kicks
• I have no conflicts of interest to disclose.

“The goal of antepartum fetal surveillance is to prevent fetal death.”

ACOG PRACTICE BULLETIN #145
Antepartum Fetal Surveillance
July 2014 (replaced 1999 version)
Case 1

• 32 yo G3 P0202 @ 7.5 weeks by LMP

• PMH:
  – **Type 2 DM**: A1C 7.8, On Levemir and Humalog
  – **Chronic HTN**: BP 150/92, On labetalol, nifedipine, and hydralazine
  – **Chronic kidney disease**: end stage renal disease- on transplant list, dialysis 6x per week, creatinine 7.62, urine protein:creatinine ratio 12,000
  – Morbid **obesity**
  – **Previous** child with caudal regression syndrome

• What is your “pregnancy management plan”?
  – Short term goals
  – Long term goals
  – Would she possibly benefit from antepartum surveillance?
Case 2

• 40 yo g6 P5 @ 18.1 weeks by LMP
• PMH: unremarkable
• Pregnancy complications:
  – Detailed US: echogenic fetal bowel
  – IUGR developed at 29 weeks
  – 34 weeks: reassuring antepartum testing
  – 35 weeks: BPP score 0/8

Outline

• Background
• Techniques
• Clinical considerations
• Summary of Recommendations
**Background**

- In animals and humans, fetal heart rate (FHR) pattern, level of activity, and degree of muscular tone
  - sensitive to hypoxemia and acidemia
- Redistribution of fetal blood flow in response to hypoxemia
  - may result in diminished renal perfusion and **oligohydramnios**
- Surveillance techniques: cardiotocography, real-time ultrasonography, and maternal perception of fetal movement
  - May identify the fetus that may be undergoing some degree of **uteroplacental compromise**.

- Identification of suspected fetal compromise provides the opportunity to intervene before progressive metabolic acidosis results in **fetal death**

- Acute, catastrophic changes in fetal status, such as those that can occur with placental abruption or an umbilical cord accident, are generally not predicted by tests of fetal well-being. *
Umbilical cord gases

- The range of normal umbilical blood gas parameters has been established by cordocentesis performed in healthy pregnancies varies by gestational age
  - Fetuses with an abnormal test result were found to have a mean umbilical vein blood pH of 7.28
  - Cessation of fetal movement appears to occur at lower pH levels; fetuses with abnormal movement were found to have a mean umbilical vein blood pH of 7.16

- Other factors than acid–base and oxygenation status can affect the biophysical parameters
  - prematurity
  - fetal sleep–wake cycle
  - maternal medication exposure
  - maternal smoking
  - fetal central nervous system abnormalities
Techniques

Maternal–Fetal Movement Assessment
• A decrease in the maternal perception of fetal movement may precede fetal death
• This provides the rationale for fetal movement assessment by the mother ("kick counts") as a means of antepartum fetal surveillance.
• Several protocols have been described, none superior
• "10 movements in 2 hours" has traditionally been used as reassuring
  – Recent studies suggest that this "2 hour alarm" is ineffective in preventing stillbirths.*


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**Count the Kicks**

Iowa lowers stillbirth rate by 32 percent in 10 years

Last week our office was looking at their two years and we felt personal stories of how they used their technology, using Count the Kicks. The last one is, how do you feel about a new condition? Three hours ago, there was a story about building movement, streaming in doctors, locating time intervals, and correcting the provider to get counted out. Three babies are saved. Healthy – and we learned about them all at once.

The statistics back up the stories. The Iowa Department of Public Health recently released its biannual report on the progress made to decrease fetal deaths. It’s an ongoing effort to ensure that fewer babies are stillborn.

What does this mean to you? 

The Iowa Department of Public Health recently released its biannual report on the progress made to decrease fetal deaths. It’s an ongoing effort to ensure that fewer babies are stillborn. Iowa’s project happened while the county’s stillbirth rate has remained relatively stagnant, according to the CDC. Count the Kicks has helped bring systemic change to Iowa when it comes to stillbirth prevention, and this was first reported in a new study where they found more ways to tell us that babies were saved due to our campaign.
https://www.countthekicks.org/

Download your FREE Count the Kicks app
Our app makes it simple to track your baby's normal movement patterns with the touch of your finger. Daily test results will are sent to you when there's no kick occurring. If you notice a change in your baby's normal movement patterns or the strength of baby's movements, call your healthcare provider right away.

Nonstress Test (NST)
• The NST is based on the premise that the heart rate of a fetus that is not acidotic or neurologically depressed will temporarily accelerate with fetal movement.

• Heart rate reactivity is thought to be a good indicator of normal fetal autonomic function.

• Loss of reactivity is most commonly associated with a fetal sleep cycle but may result from any cause of central nervous system depression, including fetal acidemia.

• Either the semi-Fowler position (sitting with the head elevated 30 degrees) or lateral recumbent position*

• External transducer

• The tracing is observed for FHR accelerations that peak (but do not necessarily remain) at least 15 beats per minute above the baseline and last 15 seconds from baseline to baseline.

• At least 20 minutes, but it may be necessary to monitor the tracing for 40 minutes or longer to take into account the variations of the fetal sleep–wake cycle.

• Vibroacoustic stimulation may elicit FHR accelerations that are valid in the prediction of fetal well being**
• Results are **reactive** or **nonreactive**
• Two or more FHR accelerations within a 20-minute period
  
  “15 by 15, twice in 20”

• Nonreactive NST is one that lacks sufficient FHR accelerations over a 40-minute period.
  – 28 weeks: 50% nonreactive
  – 32 weeks: 15% nonreactive
• May use 10 bpm if < 32 weeks
• Variable decelerations may be observed in up to 50% of NSTs
  – Nonrepetitive and brief (less than 30 seconds) are not associated with fetal compromise or the need for obstetric intervention

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**Reactive NST**

[Graph of Reactive NST]
Reactive NST

Nonreactive NST
Biophysical Profile (BPP)
Five components:

- 1. **Fetal breathing movements** — one or more episodes of rhythmic fetal breathing movements of 30 seconds or more within 30 minutes

- 2. **Fetal movement** — three or more discrete body or limb movements within 30 minutes

- 3. **Fetal tone** — one or more episodes of extension of a fetal extremity with return to flexion, or opening or closing of a hand

- 4. **Determination of the amniotic fluid volume** — a single deepest vertical pocket greater than 2 cm is considered evidence of adequate amniotic fluid

- 5. **Nonstress test** — may be omitted without compromising test validity if the results of all four ultrasound components of the BPP are normal
• Scoring
  – 2 (present) or 0 (not present) for each parameter

• A composite score of 8 or 10 is normal
• A score of 6 is considered equivocal
• A score of 4 or less is abnormal *

Maximum (or deepest) vertical pocket
Fetal breathing
Fetal movements

Fetal tone
Modified Biophysical Profile

- The modified BPP combines
  - NST: short-term indicator of fetal acid-base status
  - amniotic fluid volume assessment: long-term placental function*

- Thus, the results of the modified BPP are considered normal if the NST is reactive and the amniotic fluid volume is greater than 2 cm in the deepest vertical pocket

- Considered abnormal if either the NST is nonreactive or amniotic fluid volume in the deepest vertical pocket is 2 cm or less (ie, oligohydramnios is present).
Umbilical Artery Doppler Velocimetry

- Noninvasive technique used to assess the hemodynamic components of vascular resistance in pregnancies complicated by **fetal growth restriction**

- Flow velocity waveforms in the umbilical artery of normally growing fetuses differ from those of growth-restricted fetuses.
  - **Not IUGR**: high-velocity diastolic flow
  - **IUGR**: may show decreased umbilical artery diastolic flow
  - **Severe IUGR**: diastolic flow may be *absent or reversed*
    - The perinatal mortality rate in such pregnancies is significantly increased
- Systolic to diastolic ratio (S/D)
- Resistance index (S-D/S)
- Pulsatility index (S-D/A)
- *abnormal flow* defined as either absent or reversed end-diastolic flow
- Multiple waveforms should be assessed
- No evidence that umbilical artery Doppler velocimetry provides information about fetal well-being in the fetus with normal growth.
Contraction Stress Test
• Rarely used in current OB practices
• The CST is based on the response of the FHR to uterine contractions
• Fetal oxygenation will be transiently worsened by uterine contractions
• In the suboptimally oxygenated fetus this will lead to recurrent late decelerations
• May produce a pattern of variable decelerations caused by fetal umbilical cord compression, which in some cases is associated with oligohydramnios

• Must have at least three contractions persist for at least 40 seconds each in a 10-minute period
• Uterine stimulation is not necessary if the patient is having spontaneous uterine contractions
• Contraction are induced with either nipple stimulation or intravenous oxytocin.
• The CST is interpreted according to the presence or absence of late FHR decelerations
• A **late deceleration** is defined as a visually apparent and usually symmetrical gradual decrease and return to baseline FHR in association with uterine contractions
  
  – the time from onset of the deceleration to its FHR nadir as 30 seconds or longer
  
  – The deceleration is delayed in timing, with the nadir of the deceleration occurring after the peak of the contraction
  
  – In most cases, the onset, nadir, and recovery of the deceleration occur **after** the beginning, peak, and ending of the contraction, respectively

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**CST results**

• **Negative**: no late or significant variable decelerations

• **Positive**: late decelerations after 50% or more of contractions (even if the contraction frequency is fewer than three in 10 minutes)

• **Equivocal–suspicious**: intermittent late decelerations or significant variable decelerations

• **Equivocal**: FHR decelerations that occur in the presence of contractions more frequent than every 2 minutes or lasting longer than 90 seconds

• **Unsatisfactory**: fewer than three contractions in 10 minutes or an uninterpretable tracing
How reassuring is a normal antepartum fetal surveillance result?

• In most cases highly reassuring

• Low false-negative rate
  – Defined as the incidence of stillbirth occurring within 1 week of a normal test result.
  – NST: 1.9 per 1,000
  – CST: 0.3 per 1,000
  – BPP: 0.8 per 1,000
  – Modified BPP: 0.8 per 1,000

• Negative predictive value is 99.8% for the NST and greater than 99.9% for the CST, BPP, and modified BPP.*
Is there evidence that antepartum fetal surveillance decreases the risk of fetal demise or otherwise improves perinatal outcomes?

• No......!@&%#%$!!

• Unlikely to be conducted in a setting that can be generalized to current U.S. obstetric practice*

• In spite of its unproven value, antepartum fetal surveillance is widely integrated into clinical practice in the developed world.

What are the indications for antepartum fetal surveillance?

• All indications for antepartum testing must be considered somewhat relative

• Used in pregnancies in which the risk of antepartum fetal demise is increased
Indications for Antepartum Fetal Surveillance Testing

- Maternal conditions
  - Pregestational diabetes mellitus
  - Hypertension
  - Systemic lupus erythematosus
  - Chronic renal disease
  - Antiphospholipid syndrome
  - Hyperthyroidism (poorly controlled)
  - Hemoglobinopathies (sickle cell, sickle cell-hemoglobin C, or sickle cell-thalassemia disease)
  - Cyanotic heart disease

- Pregnancy-related conditions
  - Gestational hypertension
  - Preeclampsia
  - Decreased fetal movement
  - Gestational diabetes mellitus (poorly controlled or medically treated)
  - Oligohydramnios
  - Fetal growth restriction
  - Late term or postterm pregnancy
  - Isoimmunization
  - Previous fetal demise (unexplained or recurrent risk)
  - Monochorionic multiple gestation (with significant growth discrepancy)

When during gestation should antepartum fetal surveillance be initiated?

- Several considerations...
  - the prognosis for neonatal survival
  - the risk of fetal death
  - the severity of maternal disease
  - the potential for iatrogenic prematurity complications resulting from false-positive test results
• 60% of infants delivered because of an abnormal antepartum test result had no evidence of short-term or long-term fetal compromise

• **32 0/7 weeks** of gestation is appropriate for most at-risk patients

• In pregnancies with **multiple high-risk conditions** (eg, chronic hypertension with suspected fetal growth restriction), testing might begin at a gestational age when delivery would be considered for perinatal benefit

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**What is the recommended frequency of testing?**

• No large clinical trials to guide the frequency of testing

• The optimal frequency remains unknown

• Should be individualized and based on clinical judgment

• NST, BPP, modified BPP, or CST are typically repeated at weekly intervals*
What is the recommended management of an abnormal antepartum fetal test result?

- Antepartum fetal surveillance tests have high false-positive rates and low positive predictive values.

- Abnormal test results are usually followed by another test or delivery based on consideration of test results, maternal and fetal condition, and gestational age.

- Takes advantage of the high negative predictive value generally exhibited by all commonly used antepartum tests and minimizes the potential for unnecessary delivery based on a single false-positive (ie, false-abnormal) test result.

- Maternal reports of decreased fetal movement should be evaluated by an NST, CST, BPP, or modified BPP.

- Abnormal results from an NST or from a modified BPP generally should be followed by additional testing with either a CST or a BPP.

- A BPP score of 6 out of 10 is considered equivocal and should prompt further evaluation or delivery based on gestational age.
  - In a fetus at or beyond 37 0/7 weeks of gestation, this score generally should prompt further evaluation and consideration of delivery.
  - Less than 37 0/7 weeks of gestation, it should result in a repeat BPP in 24 hours.
• A BPP score of 4 usually indicates that delivery is warranted
  – less than 32 0/7 weeks of gestation, management should be individualized, and extended monitoring may be appropriate.
• In most circumstances, a BPP score of less than 4 should result in delivery.
• If delivery is not planned (eg, given early gestational age), then antenatal surveillance should not be performed because the results will not inform management.

Recommended fetal management by BPP score

<table>
<thead>
<tr>
<th>Result</th>
<th>Interpretation</th>
<th>% Risk of Asphyxia</th>
<th>Risk of Fetal Death (per 1,000/week)</th>
<th>Recommended Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/10</td>
<td>Nonasphyxiated</td>
<td>0</td>
<td>0.005</td>
<td>Conservative management</td>
</tr>
<tr>
<td>3/10</td>
<td>Nonasphyxiated 1/2</td>
<td>0</td>
<td>0.005</td>
<td>Conservative management</td>
</tr>
<tr>
<td>0/10</td>
<td>Nonasphyxiated 1/3</td>
<td>0</td>
<td>0.005</td>
<td>Conservative management</td>
</tr>
<tr>
<td>0/10</td>
<td>Chronic asphyxia with possible acute asphyxia 5–10</td>
<td>0.62</td>
<td>0.005</td>
<td>irthday checks, etc.</td>
</tr>
<tr>
<td>6/10</td>
<td>Acute asphyxia possible</td>
<td>0</td>
<td>0.005</td>
<td>Birth checks, etc.</td>
</tr>
<tr>
<td>6/10</td>
<td>Acute asphyxia with possible acute asphyxia</td>
<td>Greater than 10</td>
<td>Greater than 60</td>
<td>Immediate delivery (mature) or expectant management (immature)</td>
</tr>
<tr>
<td>4/10</td>
<td>Acute asphyxia likely</td>
<td>36</td>
<td>0.015</td>
<td>Birth checks, etc.</td>
</tr>
<tr>
<td>4/10</td>
<td>Chronic asphyxia with acute asphyxia likely</td>
<td>Greater than 36</td>
<td>Greater than 115</td>
<td>If mature (37 weeks or more), deliver; if not, expectant management (mature)</td>
</tr>
<tr>
<td>2/10</td>
<td>Acute asphyxia nearly contain</td>
<td>73</td>
<td>0.020</td>
<td>If mature (37 weeks or more), deliver; if not, expectant management (mature)</td>
</tr>
<tr>
<td>0/10</td>
<td>Gross severe asphyxia</td>
<td>100</td>
<td>0.500</td>
<td>If mature (37 weeks or more), deliver; if not, expectant management (mature)</td>
</tr>
</tbody>
</table>
Timing of delivery of the growth-restricted fetus on the basis of umbilical artery Doppler velocimetry

- Guidelines from the Society for Maternal-Fetal Medicine
- **Absent** end-diastolic flow
  - 34 0/7 weeks of gestation
- **Reversed** end-diastolic flow
  - 32 0/7 weeks of gestation
- **S/D ratio is elevated** (i.e., greater than the 95th percentile) but diastolic flow is still present
  - 37 0/7 weeks of gestation.

Labor induction at 39.0 weeks or beyond

- Previously, concerns related to increased cesarean delivery rate, other adverse maternal outcomes, and cost.
  - This belief was founded upon many retrospective cohort studies
- **ARRIVE** trial (N Engl J Med. 2018;379(6):513)
  - evaluated the perinatal and maternal consequences of planned induction of labor at 39+0 to 39+4 weeks of gestation versus expectant management in over 6100 low-risk **nulliparous** women across the United States
  - induction **reduced the chances of cesarean delivery** (18.6 versus 22.2 percent, relative risk [RR] 0.84, 95% CI 0.76-0.93), **hypertensive disorders of pregnancy** (9.1 versus 14.1 percent, RR 0.64, 95% CI 0.56-0.74), and **neonatal respiratory support** (3.0 versus 4.2 percent, RR 0.71, 95% CI 0.55-0.93),
– Resulted in a statistically similar frequency of the composite outcome of perinatal death or severe neonatal complications (4.3 versus 5.4 percent, RR 0.80, 95% CI 0.64-1.00).
– However, induction also increased the median duration of stay on the labor unit (20 versus 14 hours)

  – demonstrates that elective induction of labor at 39 weeks (nulliparas), compared with expectant management beyond that gestational age
  – associated with a significantly lower risk of:
    • cesarean delivery
    • maternal peripartum infection
    • and perinatal adverse outcomes, including respiratory morbidity, intensive care unit admission, and mortality.

• What about multiparas?
  – Elective induction of labor in low-risk multiparous women in the 39th week of gestation was associated with decreased perinatal morbidity and a lower frequency of cesarean delivery compared with expectant management (Obstet Gynecol 2019 Aug;134(2):282-287)

• Elective induction of nulliparas and multiparas at 39.0 weeks or beyond
  – supported by the American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal-Fetal Medicine (SMFM), and This Guy!
Case 1

- 32 yo G3 P022 @ 7.5 weeks by LMP
- PMH:
  - Type 2 DM: AsC 7.8, On Levernir and Humalog
  - Chronic HTN: BP 150/92, On labetalol, nifedipine, and hydralazine
  - Chronic kidney disease: End stage renal disease- on transplant list, dialysis 6x per week, creatinine 7.62, urine protein:creatinine ratio 12,000
  - Morbid obesity
  - Previous child with caudal regression syndrome

- Optimize medical control of DM, HTN, CKD, obesity
- Antepartum testing (2x per week) started at **28 weeks**, serial fetal growth US, scheduled early term delivery at 37.0 weeks
- IUGR and severe preeclampsia diagnosed at 30 weeks
- Delivered by repeat cesarean... baby spent 50+ days in NICU but overall did well.

Case 2

- 40 yo G6 P5 @ 18.1 weeks by LMP
- PMH: unremarkable
- Pregnancy complications:
  - Detailed US: echogenic fetal bowel
  - IUGR developed at 29 weeks
  - 34 weeks: reassuring antepartum testing
  - 35 weeks: BFP score 0/8

- Taken for emergency cesarean
- Resuscitation: chest compressions, intubation
- Apgars: 1, 1, and 4
- Alive and well without dysfunction
• The following conclusions are based on good and consistent scientific evidence (Level A):
  • The use of the deepest vertical pocket measurement, as opposed to the amniotic fluid index, to diagnose oligohydramnios is associated with a reduction in unnecessary interventions without an increase in adverse perinatal outcomes.
  • In growth-restricted fetuses, umbilical artery Doppler velocimetry used in conjunction with standard fetal surveillance, such as NSTs, or BPPs, or both, is associated with improved outcomes.

• The following recommendation is based on limited or inconsistent scientific evidence (Level B):
  • Abnormal results from an NST or from a modified BPP generally should be followed by additional testing with either a CST or a BPP.
The following recommendations are based primarily on consensus and expert opinion (Level C):

- Initiating antepartum fetal testing no earlier than 32 0/7 weeks of gestation is appropriate for most at-risk patients. However, in pregnancies with multiple or particularly worrisome high-risk conditions (eg, chronic hypertension with suspected fetal growth restriction), testing might begin at a gestational age when delivery would be considered for perinatal benefit.

- When the clinical condition that prompted testing persists, the test should be repeated periodically to monitor for continued fetal well-being until delivery. If the maternal medical condition is stable and test results are reassuring, tests of fetal well-being (NST, BPP, modified BPP, or CST) are typically repeated at weekly intervals; however, in the presence of certain high-risk conditions, some investigators have performed more frequent testing, although the optimal regimen has not been established.
• In the absence of obstetric contraindications, delivery of the fetus with an abnormal test result often may be attempted by induction of labor, with continuous intrapartum monitoring of the FHR and uterine contractions.

• Based on expert opinion, in the setting of otherwise uncomplicated isolated and persistent oligohydramnios (deepest vertical pocket measurement less than 2 cm), delivery at 36–37 weeks of gestation is recommended. In pregnancies at less than 36 0/7 weeks of gestation with intact membranes and oligohydramnios, the decision to proceed with expectant management or delivery should be individualized based on gestational age and the maternal and fetal condition.

Rural management recommendations

• Request OB or MFM consultation to develop a pregnancy management plan (Lincoln, Omaha, Sioux Falls, and outreaches at mid-size Nebraska cities)
  – Serial ultrasounds for fetal growth
  – Antepartum surveillance
  – Delivery timing and location

• In general
  – Weekly Modified BPP (NST with maximum vertical pocket of AF) starting at 32 weeks
    • Reassuring findings \(\rightarrow\) Low risk of IUFD (0.8 per 1000)  
    • Can be performed in settings with limited ultrasound capabilities
    • No significant improvement with full BPP (remember false positives! Can lead to unnecessary iatrogenic preterm delivery)
Byers Pearls

• If a patient reports concern regarding “too many appointments or ultrasounds” due to antepartum testing, remind them that you are trying to prevent a stillbirth.
• The same goes for labor induction.
• But... Be careful mentioning stillbirth too frequently... it may lead to significant maternal anxiety.
• 1 risk factor = once weekly testing
• 2 risk factors = twice weekly testing
• 40/40 “rule”: Antepartum testing if BMI or age 40 or more.

Thank You!
Thank You!

Due to a partnership with the Nebraska Perinatal Quality Improvement Council we are happy to bring you FREE Count the Kicks materials!

Healthy Birth Day, Inc. Presenter

Megan Aucutt
Associate Director of Programs,
Healthy Birth Day, Inc.
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642-485-9776
Causes of Stillbirth

The likely causes of and contributors to stillbirth identified by the study cited below are listed below in order from most common to least common:

- Pregnancy and labor complications
- Problems with the placenta
- Birth defects
- Infection
- Problems with the umbilical cord
- Medical complications in the mother

https://www.nichd.nih.gov/health/topics/stillbirth/topicinfo/causes
Count the Kicks is a highly effective, evidence-based stillbirth prevention campaign. We developed an early warning system for moms. We save 1 in 3 at-risk babies in Iowa. Our campaign is ready to go and low cost.

Healthy Birth Day
Improving Birth Outcomes

Still Birth Rate Comparison
(Stillbirth per 1,000 live births)

Emma Grace Madeline Grace Jayden
Stillbirth by the numbers

National Data

- 1:167 pregnancies ends in stillbirth

- Racial disparities persist
  - Black moms 1:94
  - Hispanic moms 1:191
  - White moms 1:204

- Families 10 times more likely to lose a baby to stillbirth than to SIDS

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1 CDC. Fetal and Perinatal Mortality: United States, 2013. National Vital Statistics Reports. Vol. 64 No. 10
Iowa Stillbirth Data

2018 Iowa stillbirth rate: 3.9 fetal deaths per 1,000 live births. Lowest Iowa stillbirth rate on record and one of the lowest in the U.S.

Iowa families lose an average of 174 babies to stillbirth every year.

Racial disparities in stillbirth are most dramatic between African American and white moms in Iowa.

While our rates are far better than the national average, we still lose one baby for every 109 pregnant black women, while for white women it’s one per 220.

Based on 5-year average, per IDPH vital statistics 2014-2018

Stillbirth by the numbers: Nebraska

Nebraska Data
- 1 in 158 pregnancies in Nebraska end in Stillbirth
- 2018: 4.3/1,000
  - 5-year average: 4.3 (2014-2018)
  - 148 babies are born still every year in Nebraska

Data is from Nebraska Public Health Department 9/8/2020
**Racial Disparities**

Why are there such large disparities for stillbirth?

- Research shows that there are a lot of contributing factors to the racial health disparities in stillbirth. Researchers point to the following as causes for the disparities:
  - **Epigenetics** - Physiological variations that are caused by external or environmental factors that switch genes on and off and affect how cells read genes instead of being caused by changes in the DNA sequence.
  - Some of those environmental factors researchers point to, are systemic racism and toxic stress. Researchers say that years of being treated unequally and/or unfairly — essentially being an African American woman in a systemically unjust society — and all that comes with it — have led to real and pervasive health issues for black women.
  - Predisposition to certain conditions that may lead to stillbirth like gestational diabetes, preeclampsia or high blood pressure, which all are linked to maternal stress. Experts say black women are less likely than other races to receive early treatment for these conditions.
  - Access to healthcare. Socioeconomic barriers.
  - Research shows education is NOT a determining factor. A college-educated black woman is still more likely to lose her baby than a high school educated white woman.
Supporters

**State Supporters**
- Nebraska Perinatal Quality Improvement Collaborative
- Iowa Department of Public Health
- Ohio Department of Health
- West Virginia Department of Health and Human Resources, Bureau for Public Health
- Missouri Department of Health and Senior Services
- Kansas Department of Health and Environment
- Florida Department of Health
- North Dakota Department of Health

**Organizational Supporters**
- International Childbirth Education Association
- Microsoft
- Black Women’s Health Imperative
- The Harkin Institute
- MercyONE
- Des Moines University
- International Paper
- Antioch Foundation

Interested in collaborating? Contact us at info@CountTheKicks.org

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University of Nebraska Medical Center

- “Impacting the rate of stillbirth in Nebraska is a priority for NPQIC. Even more importantly it is a priority for every family who could never even imagine the horror of a stillborn baby. We can help to prevent that reality by promoting the Count the Kicks App and educating the mothers in our care. It’s free and shown to save lives.”
- Dr. Ann Anderson Berry, Division Chief, Neonatology, Interim Executive Director, Child Health Research Institute, Medical Director, NPQIC, Medical Director, NICU and Newborn Nursery, Nebraska Medicine
The Research and Evidence

“Tracking fetal movement is a non-invasive way for expectant parents to monitor their baby’s health in the third trimester of pregnancy. Babies can be saved when expectant parents are educated on getting to know their baby’s normal movement pattern starting at 28 weeks and to speak up if they notice a change.”

Dr. Ruth Fretts, Harvard Medical School, Assistant Professor, Department of Obstetrics & Gynecology; Count the Kicks Medical Advisory Board Member
Additional Research Articles

- Alternations in maternally perceived fetal movement and their association with late stillbirth.
- Maternal Perception of Fetal Activity and Late Stillbirth Risk: Findings from the Auckland Stillbirth Study.
- Maternally perceived fetal movement patterns: The influence of body mass index
- Sleep Position in Pregnancy Q&A

Implementation of Count the Kicks
Count the Kicks

- Stillbirth prevention public health campaign
- Evidence-based
- Mom-focused
- Educates women on importance of tracking fetal movement
  - Mobile app & paper charts
  - Empowers moms to speak up to providers if there is a concern

- Our FREE app is available in 12 languages: Amharic, Arabic, Chinese, English, French, Haitian-Creole, Hindi, Marshallese, Russian, Spanish, Swahili and Vietnamese.
- Available for Apple and Android products
- Restart your session or delete a kick
- Set a daily reminder to Count the Kicks
- Review your kick-counting history
- Download your history to share with your provider, family or friends
- Count the Kicks with twins
- Track future pregnancies on the same profile
- Manage multiple devices registered to your account
Using the Count the Kicks App

- Create an account so you can save your data
- Add pregnancy details

Have a “Kick Session”
Talking about stillbirth with moms

“I don’t want to scare moms” – Pregnancy is full of risks that we talk to moms about. Stillbirth is another risk that people deserve to be educated about.

“Stillbirth just happens, there’s nothing we can do” – There can be warning signs. If moms know what to look for.

“Her baby is always active, it’s not a concern” – Babies are active until they aren’t. Cord and placental accidents can be sudden. Moms need to know what’s normal, so they can notice a change.

“She’s almost at her due date” – The risk of stillbirth increases as a mom approaches or exceeds her due date.

Misconceptions

- Babies move less the closer they are to their due date.
- I can hear baby’s heartbeat on a doppler device, so I don’t need to worry about movement.
- Baby is just getting ready for birth and “running out room.”
- Mom’s should get 10 kicks in 2 hours.

Babies do NOT move less, they might move differently. You may feel less sharp kicking and more rolling. However, if you are monitoring the baby’s movements at the same time each day, it should take about the same amount of time to feel 10 movements.

A change of the baby’s heartbeat is one of the last things to occur when a baby is in distress, whereas decreased movement is an early sign.

Babies should continue to move up to and during birth.

This is a common misconception and outdated information. What research now states is that moms should be focusing on fetal movement in general and understanding their baby’s pattern.
Talking about Count the Kicks

- **When:**
  - 26 weeks if high risk, 28 weeks otherwise
- **How:**
  - Do you know about the importance of tracking your baby’s movements?
  - Let’s talk about how to track your baby’s movements.
  - Share how movements are jabs, rolls, pushes, anything but hiccups
  - Share the Count the Kicks App
    - Helpful tip! If they are waiting on glucose test, this is the perfect time to download the app!

Remember ...

- Stress the importance of knowing their baby’s normal and speaking up if there is a change.
- Make sure mom knows the number to call if there is a concern.
- Talk about how movements usually change as the weeks progress.
- Share brochure to mom and/or app card.
- Help mom download the app and walk through the app together.
- Share the app that research shows evening is usually the best time to count baby movements.
- Ask about baby movement at every time you meet with mom in the 3rd trimester.
  - “Tell me about your baby’s movements.”
  - “How is tracking your baby’s movements going?”
  - “Can you show me your Count the Kicks graph?”
  - “What questions do you have about your baby’s movements?”
Implementation of Count the Kicks

- Familiarize yourself with Count the Kicks materials and the app
- Order Count the Kicks Materials at: www.countthekicks.org
- Should only take 3 to 5 minutes with your mom.
- Make sure entire team knows about this campaign and the importance of tracking fetal movement.
- Use Electronic Health Records/Implement into standard protocol.

Labor and Delivery Triage

- What’s your current protocol when someone presents with Reduced Fetal Movement?
- Is the entire staff trained on how to handle an expectant mother who calls or comes in with Reduced Fetal Movement?
- What, if anything, is on the discharge papers regarding what moms should do about Reduced Fetal Movement?
  - Ensure Count the Kicks information is on the discharge paper, every mom that comes in with RFM and is sent home after tests should be given literature.
  - Ensure mom/significant others know who to contact.
A few notes….

Sharing CTK with Pregnant women

- Stress to parents to trust their instinct! If mom feels concerned or that something isn’t right, call the doctor.
- Share that sleeping/lying on their left side is best for them and baby.
- Review Common Myths
- Discuss plan of action if mom notices RFM and how long her drive is.

COVID-19 Resources

- Created *Count the Kicks* academies for patients and providers, a suite of resources to navigate a time where in-person interaction between patient and provider is less frequent.
- Providing factual, evidence-based information on COVID-19 and pregnancy on our website and on social media. We are updating frequently as new information comes in.
- *Count the Kicks* is early warning system.
Count the Kicks Academy

► For Providers:
  ► Count the Kicks Academy for Providers is a suite of educational videos, guides, and resources to help maternal healthcare professionals implement our successful evidence-based campaign and have the kick counting conversation with expectant parents.

► For Parents:
  ► Count the Kicks Academy for parents is a suite of educational videos, guides, and resources to help expectant parents get their baby here safely.

www.CountTheKicks.org

Additional Material

► Visit www.CountTheKicks.org
► Click on ORDER MATERIALS
► Click on Nebraska
► Fill your shopping cart
► Check out!
► Free materials!
Ambassadors

- Shannon Vaccaro, Nebraska Ambassador
- Two angels: Alfy, stillborn in April 2012 and Anna (miscarriage in June 2016)
- “In finding Count the Kicks, I have found a way to educate other mothers on the possibility of stillbirth, in a non-threatening, empowering manner. Providers are a key stakeholder in helping spread the word of Count the Kicks and a crucial collaboration with the Nebraska Perinatal Quality Improvement Collaborative (NPQIC) has been formed to do just that. By opening the communication lines between providers and mothers, babies can be saved!”

Baby Save Stories

www.CountTheKicks.org/BabySaves
Connect with Us!

- Facebook: @countthekicks
- Instagram: @countthekicksus
- Twitter: @countthekicksus
- Website: [www.CountTheKicks.org](http://www.CountTheKicks.org)
  - Sign up for our newsletter
- CE Training: Running a special for the conference: Use Code Savebabies-NE to get half off!
  - [https://cme.dmu.edu/SaveBabies](https://cme.dmu.edu/SaveBabies)

Let’s save babies together!

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- 641.485.9776