GBS is a leading cause of life-threatening infections in newborns. According to the most recent statistics, approximately 1,600 neonatal Early-Onset GBS infections are reported each year, nationwide; resulting in about 80 newborn deaths annually. Before universal screening/treatment, approximately 7,500 babies in the U.S. per year got GBS Disease, and about 300 babies died. Since the implementation of active prevention efforts, the incidence of Early-Onset GBS Disease has declined by >75%.

We have developed this handout in order to provide you with the latest information, recommendations, options, and alternatives with regard to Perinatal GBS Colonization and Newborn GBS Disease. The question/answer format was designed to help you get the answers you need. Please feel free to ask questions about Group B Strep so that you are fully informed! The information in this handout was taken from the 2010 Revised CDC Guidelines for the Prevention of Perinatal Group B Streptococcal Disease and Evidence Based Birth – Group B Strep in Pregnancy: Evidence for Antibiotics and Alternatives.

What is Group B Strep?
Group Beta Streptococcus (Streptococcus Agalactiae, aka: GBS, Strep B, Group B Strep) is a bacteria that lives on/in the human body and in our environment. GBS is benign, meaning that it causes few illnesses or infections in the general population. It is most commonly found in the bowel, bladder, and vagina. One doesn’t carry it all the time. GBS causes few problems in healthy adults. In pregnant women, GBS may cause infections of the urinary tract (UTIs) or of the uterus. The standard of care treatment for all of these infections is the use antibiotics.

Alternative therapies such as dietary modifications, use of Probiotics, Vitamin/Mineral & herbal supplements, and holistic vaginal remedies all demonstrate positive empirical results in the prevention, reduction, and/or elimination of maternal GBS colonization. Recommendations for these alternative therapies are included on page 4 of this handout.

What are the Risks of GBS Disease to my Baby?
GBS bacteria CAN but does not always cause invasive GBS Disease in newborns. Most newborn GBS infections occur in the first week of life (most within the first 24-hours) and are known as Early-Onset GBS Disease. Early-Onset GBS Disease is the most common cause of newborn sepsis (blood infection) and/or neonatal pneumonia, and less often the cause of contact meningitis (infection of the fluid and lining surrounding the brain), osteomyelitis (bone infection), and/or septic arthritis (inflammation of the joints due to infection). These serious infections can lead to death. Preterm babies (<37wks) are more likely to die than full-term babies. Babies that survive serious infections may be blind, deaf, brain damaged, mentally retarded, and/or learning disabled. Late-Onset GBS Disease occurs after the first week of life, with most late-onset infections evident within the first 3 months. Late-Onset GBS Disease often leads to meningitis.

What are Risk Factors for GBS Disease?
Epidemiologic studies in the ’80s revealed that GBS POSITIVE women were >25 times more likely than women with NEGATIVE results to deliver infants with Early-Onset GBS Disease. The risk of Early-Onset GBS Disease is highest when:

- A baby is born prematurely (before 37 weeks);
- The mom develops a fever during labor (>100.4°F);
- The bag of waters is broken for more than 18 hours before birth;
- Mom previously had a baby with GBS Disease;
- Mom has GBS present in her urine during THIS pregnancy.

Other factors increase the risk of early-onset disease: intra-amniotic infection, young maternal age, black race, Hispanic ethnicity, low levels of anticapsular antibodies in the mother. Babies of GBS POSITIVE mothers WITH any of these risk factors are AT RISK, therefore, intrapartum antibiotics are highly recommended. Signs of sepsis in any newborn can be an indication of Early-Onset GBS Disease, regardless of maternal colonization status.

How Common is GBS Colonization and Newborn GBS Disease?

- Among ALL pregnant women in the USA, 10%-30% are colonized with GBS at any time during their pregnancy. (2010 CDC Guidelines)
- In this era of universal screening, > 60% of early-onset GBS cases occurred among infants born to GBS- (negative) women. (Ibid)
- For moms who are GBS+ (positive) with no known risk factors, whose baby is born full-term, in the absence of any intervention, an estimated 1% to 2% of infants develop early-onset GBS infections. (2010 CDC Guidelines)
- Of babies who weigh MORE than 5 lbs 10 oz, less than 1 in 1,000, regardless of mother’s GBS status, will develop GBS Disease.
- Of those full-term infants who develop GBS Disease (approx. 840/year), 2 to 3% (17 to 25 babies) will die. (2010 CDC Guidelines)
How Do Babies Get GBS Disease?

Babies may be exposed to GBS before, during labor/birth, and/or after delivery. If a mother's membranes are ruptured ("water breaks"), her baby may come in contact with GBS through aspirating (breathing in) infected amniotic fluid, if the bacteria have traveled upward from the vagina into the uterus. A baby may also be exposed to GBS while passing through the vagina, although the majority of infants who are exposed in this way become colonized on skin or mucous membranes, but remain asymptomatic. There is also evidence that GBS MAY cross over intact amniotic membranes, exposing the fetus while it is still in the uterus. This exposure may cause preterm births, stillbirths, or miscarriages. Certainly, there is risk of iatrogenic exposure to hospital-borne GBS bacteria when babies are born in hospital. Only about half of Late-Onset GBS Disease among newborns comes from a mother who is colonized with GBS, thus the source of infection for others infected with Late-Onset GBS Disease is unknown, but undoubtedly within the newborn’s living/childcare environment(s).

What are the symptoms of Newborn GBS disease?

**WARNING:** Any of the following symptoms could indicate Newborn GBS Disease in your baby and should be evaluated by a pediatric provider immediately:

- Breathing problems (too slow or too fast, grunting, nasal flaring, retractions)
- Heart rate and/or blood pressure abnormalities
- Bluish-colored skin tone
- Unstable temperature (low or high)
- Not eating well (unwillingness or inability to feed)
- Irritability or fussiness
- Extreme drowsiness (lethargy), Limpness, stiffness, or seizures

How is Newborn GBS Disease Diagnosed and Treated?

Newborn GBS Disease is suspected when a newborn becomes symptomatic and the disease is diagnosed when the bacteria are identified from body fluid samples, such as mucous, blood, or spinal fluid, which have been cultured in a laboratory. Cultures may take up to a week to complete and receive the results, although more rapid screening tests are currently under development. Newborn GBS Disease is treated with IV antibiotics. Hospital stays for GBS infected newborns can be 7 to 14+ days.

How do I know if I have GBS?

Urine cultures are performed during pregnancy as medically indicated, with oral antibiotic treatment recommended for women whose cultures are POSITIVE. Vaginal screening is offered at 35-37 weeks, in accordance with the 2010 CDC Guidelines. The test is performed by inserting a sterile swab into the vagina, taking a sample of fluids from there. These fluids are then set to the lab and grown in a culture. Results are usually available within 48 hours. A normal culture is NEGATIVE (-) or reported as “No Growth.” A POSITIVE (+) culture means that you are COLONIZED with GBS. It DOES NOT mean that you or your baby are or will become ill.

What are the Benefits of Being Tested for Group B Strep (GBS)?

Knowing your GBS status allows you to make the best, informed decision about your care and the care of your baby. If you carry GBS at the time of birth and choose to receive IV antibiotics, the chance your baby will develop GBS disease is very small. If you test negative and need to transfer to a hospital for birth, you will not need IV antibiotics to prevent GBS disease (but may receive them for other medical indications). If your transfer to hospital with an unknown GBS status, the likelihood is HIGH that IV antibiotic treatment will be recommended, especially if you present with ANY other risk factors. Knowing these scenarios prepares you for having those discussions and making your best decisions accordingly.

How is the Risk of Newborn GBS Disease Reduced?

The CDC & American College of Obstetricians and Gynecologists (ACOG) recommend that treatment with IV antibiotics (preferably penicillin, if not allergic) during labor should be offered to all women who:

- test positive for GBS, or
- who previously had a baby with GBS disease, or
- who have had a urinary tract infection caused by GBS during THIS pregnancy, or
- who have NOT been tested for GBS AND who have one or more of these risk factors:
  - A baby is born prematurely
  - The mom develops a fever during labor
  - The bag of waters is broken for more than 18 hours before birth

IV antibiotics quickly kill bacteria, thus lowering the risk of Newborn Early-onset GBS Disease. The best prevention for GBS exposure in our environment is good hygiene and regular hand-washing.
IF I am GBS POSITIVE (GBS+), What is the Recommended Treatment by the CDC?

The 2010 CDC Guidelines recommend that GBS+ (colonized) women should NOT take oral antibiotics before labor, as studies indicate that such treatment DOES NOT prevent GBS Disease in newborns. The revised CDC Guidelines recommend that, “Intrapartum antibiotic prophylaxis is the method of choice for preventing neonatal early-onset GBS Disease.” This treatment recommendation translates that: GBS+ mothers should be offered intravenous (IV) antibiotics (penicillin, ampicillin, cefazolin, clindamycin, erythromycin, or vancomycin) during labor at four-hour intervals, with Penicillin being the “agent of choice.”

2010 CDC Guidelines state, “Although the intramuscular route of administration for penicillin has been evaluated, intravenous administration in the only route of administration recommended for intrapartum chemoprophylaxis to prevent perinatal GBS Disease, regardless of the antimicrobial used, because of the higher intra-amniotic concentrations achieved with this method.”

Parents should know that CDC Guidelines neither discuss out-of-hospital birth settings, nor do they offer guidelines for birth center or home births, nor has there been any effort to study the subject of GBS management in non-hospital settings. Site-appropriate recommendations for intrapartum, antibiotic administration in out-of-hospital settings are NOT addressed at all in the 2010 CDC Guidelines. Since the CDC makes no alternative, intrapartum, antibiotic administration recommendation for out-of-hospital settings, there is the inference that GBS POSITIVE (GBS+) women should have hospital births exclusively. While the CDC did review a handful of studies with regards to the intramuscular route of administration, their recommendation exclusively promotes IV antibiotics; administered in hospital (all the studies cited in the 2010 CDC Guidelines were conducted in hospital settings).

I am Choosing a Midwife-Attended, Home or Birth Suite Birth, Can I be Treated with IV Antibiotics?

Because Utah Licensed Direct-Entry Midwives (LDEM) can acquire, carry, and administer medications, the use of antibiotics (as recommended by the CDC, ACOG & ACNM) is available to clients of the Home Birth Midwifery Service. If you are GBS+ and opt for IV (intravenous) or IM (intramuscular) antibiotics (Abx), you can receive that treatment without making special arrangements! You can also opt for vaginal lavage with chlorhexadine (see next section). Clients always have the right to refuse treatment, but must demonstrate their informed consent and sign a declination. Be sure to talk with your midwife about these treatment options!

What are my Treatment Options if I DECLINE IV Antibiotics? What are the Alternatives?

We continue to read the latest literature and research regarding GBS prevention strategies including non-invasive, non-allopathic, and holistic options. See the back page of this handout for such a treatment regimen. Newer research studies, from the U.S., Italy, Sweden, and Netherlands investigated the efficacy of vaginal lavage (douthing the vagina) or the use of vaginal gel, with a solution containing 0.2% chlorhexadine (an anti-microbial, surgical soap also known as Hibiclens®). It has been shown to be very effective in the prevention of Perinatal Group B Strept Disease. Furthermore, this regimen also reduced the rate of neonatal E. Coli colonization. We have this treatment option available at the birth center.

And as stated in the previous section, you may opt for an intra-muscular (IM) injection of an antibiotic such as: Rocephin® (Ceftriaxone), Amoxicillin, or Penicillin (benzathine penicillin G) during your labor. While not a standard of care treatment option in the medical community, we and our collaborating physician(s) recognize that women choosing out-of-hospital birth need a suitable and effective alternative to intravenous antibiotic treatment if they so choose such.

What Other Information should I Know? What about Risks Associated with GBS and the Use of Antibiotics? What about yeast infections? Should I be Concerned with Allergic Reactions or Antibiotic Resistance?

While multiple studies, cited by the CDC, show that giving GBS+ pregnant women IV antibiotics during labor can prevent most perinatal GBS Disease, the decision to take antibiotics should balance the risks vs. benefits. And while Penicillin is very effective at preventing perinatal GBS Disease and is generally safe, a colonized woman with no other risk factors has the following risks:

- An increase of maternal and newborn yeast infections. In one study, 15% of women who received antibiotics in labor had mother-baby yeast infections, compared to 7% of mothers who did not have antibiotics. (Dinsmoor et al. 2005)
- For moms who are GBS+ (positive) with no known risk factors, whose baby is born full-term, in the absence of any intervention, an estimated 1% to 2% of infants develop early-onset GBS infections. (2010 CDC Guidelines)
- 0.7% to 4.0% chance of experiencing a mild, allergic reaction (such as rash) to penicillin; (2010 CDC Guidelines)
- 4 per 10,000 to 4 per 100,000 chance of experiencing penicillin anaphylaxis (severe, life-threatening, allergic reaction). (2010 CDC Guidelines)

Because antibiotics can kill ALL body flora (bacteria) that would colonize the newborn’s skin and digestive tract, the newborn is left very vulnerable to antibiotic-resistant GBS infections as well as other bacteria such as antibiotic-resistant E. Coli and MRSA. However, among all neonates, rates of E. coli early-onset sepsis have remained stable and are lower than those of GBS early-onset disease, despite declines in GBS infection rates. (http://www.princeton.edu/~ota/disk1/1995/9503/950306.PDF)
Begin this regimen at 32 weeks of pregnancy, as empirical evidence shows that this course of preventative treatment takes ~ 3 weeks to obtain negative results. Once negative results at 35-37 weeks are obtained, it is recommended that you continue the regimen to provide the best possible likelihood that you remain GBS – (negative) at the time of birth.

Twice a day, with breakfast (one dose) and with dinner (one dose), take by mouth:

- **Acidophilus with L. Bifidus** – 4 billion+ cells/dose (take this at lunch and bed time, too!), or any other multi-Probiotic formula (*Jarro-Dophilus EPS* is a great option!)
- **Echinacea** – 350 mg capsules, 2 capsules (total: 700 mg/dose),
- **Garlic (odorless)** – 500 mg capsules, 2 capsules orally (total: 1000 mg/dose),
- **Vitamin C** – 500 mg with 200 mg Bioflavonoids/dose,
- **Alfalfa** – 3 tablets/dose (Vitamin K), (take this at lunch time, too!)
- **Grapefruit Seed Extract** – 15 drops/dose.

**In addition to these supplements, you should:**

- Drink **8 to 10** glasses of water/day.
- Be sure your diet is high in **fiber** (see food recommendations/restrictions below).
- Eat plenty foods high in **Vitamin K**: leafy dark greens, whole grains such as oat bran or flax seed, black strap molasses, broccoli, cauliflower, egg yolks, and strawberries.
- Include **yogurt** or **kefir**, with live/active cultures, in your diet plan.

- **Increase ↑ Acid-forming foods** such as: fish, poultry, eggs, meats (except lamb) & shellfish, asparagus, olives, legumes, lentils, cranberries, plums, prunes, oatmeal, noodles, and pasta.
  See this link: [http://rense.com/1.mpicons/acidalka.htm](http://rense.com/1.mpicons/acidalka.htm)

- **Reduce ↓ Alkaline-forming foods** such as: citrus fruits (oranges, tangerines, grapefruit, lemons, limes, pineapples and tomatoes), avocados, corn, potatoes, mushrooms, nuts, & seeds.
  See this link: [http://rense.com/1.mpicons/acidalka.htm](http://rense.com/1.mpicons/acidalka.htm)

- **Reduce or Limit** your intake of **antacid medications** such as Tums, Maylox, Rolaids, etc. These products are alkaline-based and should be minimized during GBS treatment.

- Consider taking other **antibacterial supplements** such as: Colloidal Silver, Olive Leaf Extract with Oleuropein, Pau d’arco Tea, Clove Tea, Ginger Tea, Maitake Tea, Chlorophyll.

- Discuss, with your midwives, the use of prenatal **vaginal lavage/douching** with a variety of herbal/holistic solutions including: comfrey, calendula, garlic, echinacea, goldenseal, plantain, St. John’s Wort, tea tree oil, white vinegar, Acidophilus/L. Bifidus, or plain yogurt.

**HIGHLY RECOMMENDED:** Eight (8) days before GBS screening, use peeled garlic cloves, vaginally overnight and then every other night until the onset of labor.

See these links: [http://www.gentlebirth.org/archives/gbsCohain.html](http://www.gentlebirth.org/archives/gbsCohain.html)