

## Preconception Care — Common Medical Problem, Substance Abuse during Pregnancy and First Prenatal Visit

[See online here](#)

**Preconception care is medical care focusing on the health of women (and men) of child-bearing age before pregnancy. The goal is to address medical conditions and substance use that could negatively impact the pregnancy or baby. By having these under control before the pregnancy itself, preconception care increases the chances for an uneventful pregnancy and a healthy baby.**



### The First Weeks

The early weeks of the pregnancy are very important to the normal growth of a baby, as **organogenesis** occurs during the 3<sup>rd</sup> to 8<sup>th</sup> weeks. At this point, the fetus is very susceptible to **teratogens**. The most common teratogens are **tobacco**, **alcohol**, **medications**, and **illegal drugs**.

It is recommended that anyone planning to become pregnant have a **preconception care checkup**. Women may not realize they are pregnant until they are already several weeks into the pregnancy, often past the point of organogenesis. Even if they were to stop doing activities that could potentially affect the pregnancy the moment they realized they were pregnant, it could have already affected the fetus.

# Common Medical Problems in Pregnancy

The goal of preconception care is to optimize medical problems to decrease maternal and fetal morbidity and mortality. There are many medical conditions that can affect pregnancy. Below is a list of the more common medical concerns, how they could negatively affect pregnancy, and how they should be treated.

## Diabetes

There are three **types of diabetes** to consider in pregnancy – type I, type II, and gestational diabetes. Type I is usually a part of the maternal history before pregnancy and type II is either part of the history or tested for during preconception care.

**Gestational diabetes** is a type of diabetes that first occurs in women during pregnancy, usually during the middle of the pregnancy. It is tested for at around 24-28 weeks.

If the mother's blood sugar is high from uncontrolled diabetes, this may lead to the baby's blood sugar to be high. This may cause the baby to be larger than expected, known as **macrosomia**. This can lead to higher risks during delivery and make C-section more likely. The infant is also more likely to have episodes of **hypoglycemia**. For patients with diabetes, it is recommended to control one's blood sugar by eating healthy foods, exercising, taking medication as needed, and monitoring blood sugar.

### Risks of diabetes to pregnancy:

- Congenital malformations
- Pregnancy loss
- Fetal macrosomia or growth restriction
- Diabetes ketoacidosis
- Maternal and perinatal mortality

## High blood pressure



**Image:** "Measurement of the blood pressure of a pregnant woman. " by nih.gov – [http://www.nih.gov/researchmatters/november2009/images/preeclampsia\\_1.jpg](http://www.nih.gov/researchmatters/november2009/images/preeclampsia_1.jpg).  
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There are two types of **hypertension** – chronic hypertension and gestational hypertension. Chronic hypertension is diagnosed either before pregnancy or before 20 weeks. **Gestational hypertension** is hypertension that first occurs at or after 20 weeks gestation.

High blood pressure during pregnancy can decrease the flow of nutrients to the fetus as well as restrict blood flow to the placenta. It increases the **risk of fetal growth restriction, pre-eclampsia, preterm delivery, placental abruption, and C-section**. During the pregnancy, blood pressure should be monitored frequently and the growth of the baby should be evaluated with ultrasound.

## Obesity

Obesity is defined as having a **body mass index (BMI) of 30 or greater**. Within this category, the health risks of pregnancy increase with higher BMI: the lowest risk is from 30 to 34.9; the medium risk is from 35 to 39.9, and high risk is 40 or greater.

With obesity, there is an increased risk of **gestational diabetes, preeclampsia, and sleep apnea**. And an increased risk of **macrosomia, preterm birth, and stillbirth** to the baby.

It is recommended that the best way to avoid problems from obesity is by losing weight before the pregnancy, which is something that should be discussed during a preconception visit. During the pregnancy, the mother's weight and the baby's growth should be monitored closely. The mother's weight may not increase as much as the guidelines suggest, but this is considered to be acceptable as long as the baby is growing normally.

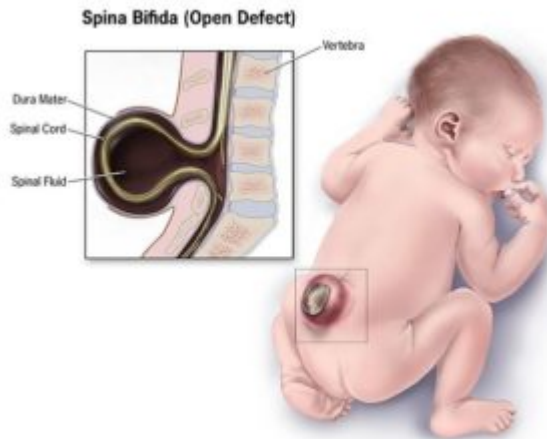
## Human immunodeficiency virus

**HIV** is spread through the sharing of bodily fluids and in pregnancy, there is a chance for the baby to become infected from an HIV-positive mother. This infection can happen through the **placenta** during pregnancy, or more commonly, during the **delivery process** itself.

To avoid passing HIV to the baby, it is important for mothers to be tested for HIV as they may not have symptoms yet. If they are HIV-positive, they should be put on a **combination of medications** to keep the viral load down. A **C-section** should be considered if the viral load stays high to reduce the exposure of the baby to the maternal bodily fluids.

After delivery, the baby will be tested for HIV multiple times and will also be given anti-HIV medication. As HIV can be spread through **breastfeeding**, mothers who are HIV-positive should not breastfeed.

## Vitamins and folic acid



**Image:** "An illustration of an infant with spina bifida." by Centers for Disease Control and Prevention - Centers for Disease Control and Prevention. License: Public Domain

It is important to have a **healthy diet** to provide the proper nutrients for the baby. There are recommendations on how much of the five food groups (grain, fruits, vegetables, protein, and dairy) a pregnant woman should have daily. To make sure she has all the necessary vitamins and minerals for the pregnancy, women may take a **prenatal vitamin supplement** every day.

**Folic acid** is a type of vitamin B that has been shown to **prevent neural tube defects**, such as **spina bifida**. Guidelines recommend having 600mg of folic acid a day but it is hard to achieve this through a normal diet. Therefore, it is recommended to take a daily supplement of 400mcg of folic acid before and during the pregnancy.

## Medication side effects

There are many medications that are contradicted during pregnancy. Below is a list of common medications that should be avoided and the potential complications they are associated with.

- **Antibiotics:** aminoglycosides (ototoxicity), tetracyclines (yellow teeth)
- **Anti-hypertensives:** [ACE inhibitors](#) (oligohydramnios, [renal failure](#)), ARBs (renal dysplasia)
- **Anti-convulsants** (facial dysmorphism, neural tube defects, congenital heart disease)
- **Psychiatric medications:** lithium (cardiac abnormalities, including [Ebstein's anomaly](#))
- **Isotretinoin** (facial abnormalities, congenital heart disease, neural tube defects)
- **Warfarin** (skeletal abnormalities)
- **Thalidomide** (limb defects)
- **Diethylstilbestrol** (vaginal clear cell adenocarcinoma)

## Substance Abuse in Pregnancy

### Tobacco

Smoking and tobacco use can decrease the **fertility** of both women and men as well as increase the risk of [spontaneous abortion](#).

There are many mechanisms by which smoking is harmful, and it is important to remember that **nicotine is a strong vasoconstrictor**, which reduces uterine and placental blood flow, thus affecting the fetal blood supply. It thereby increases the risk of **low birth weight, premature birth, placental abruption, and SIDS**.

Pregnant women, or those who want to become pregnant, should be counseled on **quitting smoking**.

## Alcohol abuse

Alcohol can cause a number of **disabilities** in children, which fall under the category of **fetal alcohol spectrum disorders (FASD)**. Of these, the most severe is **fetal alcohol syndrome (FAS)**, which can involve congenital and facial abnormalities, growth retardation, and intellectual disability.

Although the number of children affected by FASD is debated, studies have estimated that **up to 1 in 100 children** have FASD. No amount of alcohol can be considered safe during any point of the pregnancy and it is recommended that women trying to conceive **avoid alcohol completely**.

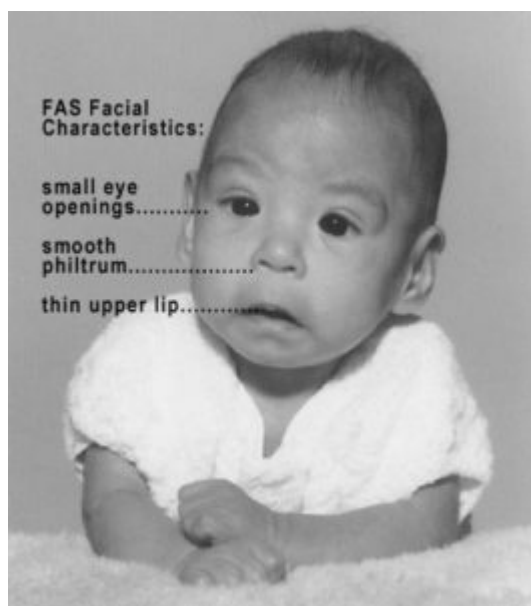


Image: "Male Baby with FAS." by Teresa Kellerman.  
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Characteristic Craniofacial Features:

- Short palpebral fissures
- Flat and small midface
- Long and flat philtrum
- The thin vermilion border of the upper lip
- Small head circumference
- Small eye opening

## Opioids

Chronic untreated heroin addiction is associated with a number of risks including **IUGR, placental abruption, preterm labor, and fetal death**. Although the exact mechanism is unclear, it is thought to be due to the effects of withdrawal on the fetus and the

placenta.

During the pregnancy, through the placenta, the baby has access to the opioids the mother intakes and can become dependent on them. Once born, the baby may have **neonatal abstinence syndrome** and need to stay in the hospital to treat withdrawal symptoms.

Pregnant women should be started on **opioid maintenance treatment** involving **methadone** or **buprenorphine**. However, medically assisted withdrawal is not recommended during the pregnancy due to the potential effects on the baby.

## Initial Prenatal Visit

At the initial prenatal visit, a **full history** and **physical** will be done. The medical problems and substance use described above will be checked for and treatment will be started, if necessary. **Blood tests** and **urinalysis** will also be done.

## Complete blood count

A complete blood count (CBC) is done to determine if the mother has any anemia such as **iron-deficiency anemia**, which can increase the risk of low birth weight, preterm delivery, and perinatal mortality. These women should be started on iron supplements to help boost their red blood cell count.

## Blood type test

A blood type test will test for **Rh factor**, a marker present on red blood cells. The Rh factor can cause a problem called **Rh factor incompatibility** if the mother is Rh-negative and the baby is Rh-positive.

During her first pregnancy, an Rh-negative mother will usually not have problems with an Rh-positive baby. But if the mother's immune system has previously seen Rh-positive blood through a previous pregnancy, it may be sensitized towards Rh factor, which means that it can produce antibodies against Rh factor. These antibodies can then cause **fetal hemolytic anemia** as it sees the Rh-positive fetal red blood cells and destroys them.

This problem can be avoided by giving the mother an injection of **Rh immunoglobulin (Rhlg)** during her first pregnancy. This immunoglobulin will cover any Rh factor presenting red blood cells in the bloodstream, preventing the mother's immune system from recognizing it and developing antibodies towards it.

She should also receive Rhlg in the middle of her pregnancy **at around 28 weeks** as well as **within 72 hours after delivery**. This will help prevent problems with future pregnancies with Rh-positive babies.

## Urinalysis/urine culture

**Urinalysis** is done to test for **urinary tract infection (UTI)**, which is more common during the early stages of pregnancy. It is usually caused by *E.coli* and is more common in pregnancy due to changes in the level of **progesterone**, which relaxes the ureter muscles.

**Asymptomatic bacteriuria** can progress to UTI, and to avoid this, a course of

medication is usually started. UTI in pregnancy increases the risk of **low birth weight**, **premature labor**, **sepsis**, **pneumonia**, and **miscarriage**. To prevent UTIs, it is recommended to drink 8 glasses of water, use the bathroom regularly, avoid soaking in tubs, and eat an antioxidant-rich diet.

## Rubella

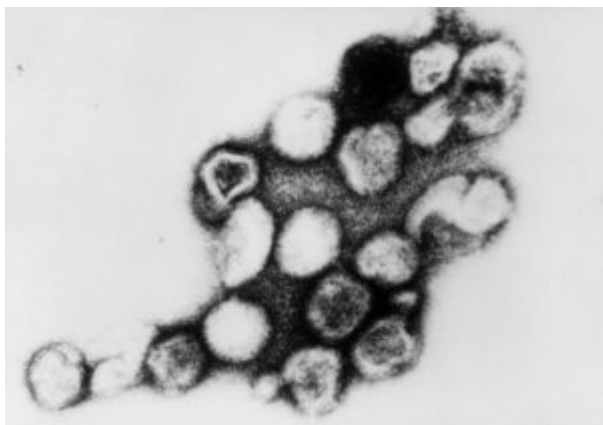


Image: "Rubella virus." by CDC/Dr. Erskine Palmer. License: Public Domain

Rubella, also known as **German measles**, is a virus that is part of the **combination vaccine MMR**. Blood tests can reveal if the mother has been vaccinated or had the previous infection by looking for a positive Rubella IgG test, which indicates immunity.

If the mother is non-immune and is infected with rubella during the pregnancy, this can lead to birth defects in the baby, classically thought of as a **triad of cataracts, deafness, and PDA**. In the case of a non-immune mother, she should avoid those with Rubella and get the vaccine after the baby is born. The vaccine should not be administered during pregnancy as it is a live virus vaccine.

## Hepatitis B and C

Hepatitis B and C are viruses that a mother can spread to her baby with **bodily fluid contact**. For hepatitis B, the mother has a 90% chance of passing it to her baby if she has acute hepatitis B and between a 10-20% chance of passing it if she has chronic infection. To prevent the spread of hepatitis B to the baby, the baby should be given a dose of **hepatitis B immunoglobulin** as well as the **normal hepatitis B vaccination series**.

For hepatitis C, the mother has a 4% chance of passing it to her baby, which is dependent on her viral load. There is **no vaccine for hepatitis C or immunoglobulin** and so the baby will be tested at around 18 months of age.

## Sexually transmitted infections

Sexually transmitted infections can cause a variety of problems in pregnancy.

**Gonorrhea** and **chlamydia** are common infections that can increase the risk of **miscarriage** and **preterm birth**. Babies can also become infected by exposure to the mother's cervix, in which case they can develop **eye infections**, **pneumonia**, as well as **sepsis**. Both gonorrhea and chlamydia can be treated during pregnancy and babies that are infected should also be treated.

Although **syphilis** is rarer, it is tested due to its severe consequences if left untreated. Syphilis is able to reach the baby through the placenta and thus infects the baby **in utero**. It increases the risk of **miscarriage** and often results in **stillbirth**.

A baby born with congenital syphilis can have serious neurological problems, such as deafness, as well as skeletal deformity, jaundice, and facial abnormality. To treat both mother and baby for syphilis, the mother should be started on penicillin during the pregnancy.

## Maternal herpes infection

Women with active genital lesions should have a C-section while those without active genital lesions can have vaginal delivery. Breastfeeding is only contraindicated if there is a lesion on the breast.

## References

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