

# BIRTH CONTROL AND DIABETES: PART 1

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## ABSTRACT

For women with diabetes, family planning is especially important. Knowing the different types of birth control available, women with diabetes can make informed decisions about their reproductive health and choose the best method available for them. Hormonal contraception in the form of a pill, a patch, or a ring is safe for women with good glucose control, provides positive health benefits with few side effects, and is easily reversible. This article is Part One of a two-part series that discusses birth control options for women living with diabetes.



People Living with And Inspired by Diabetes

## INTRODUCTION

To ensure the health of both the mother and the baby, it is important to think about your goals regarding pregnancy and make a plan to accomplish them. Whether you do or do not wish to become pregnant, this is called a reproductive life plan. Because women with uncontrolled diabetes face higher rates of complications to the mother and unborn baby [1], it is particularly important to plan ahead for both a successful pregnancy, and to avoid unintended pregnancies. For women with diabetes, good blood glucose control is recommended three to six months before becoming pregnant and throughout the pregnancy [2]. Many women may also need their medications adjusted to ensure everything is safe to use during pregnancy.

A number of methods exist to prevent pregnancy until the time is right. The most common of these methods is referred to as “the pill,” but what you may not know is that the hormones found in the pill can also be absorbed through your skin in the forms of “the patch” and “the ring.” This article is Part One of a two-part series and will focus on easily reversible hormonal birth control. Part Two in this series will concentrate on the long acting and permanent birth control options.

## BACKGROUND

In order to become pregnant, a few things must happen. First, the ovary must release an egg, which is controlled by the hormone estrogen. The egg will then travel through the fallopian tube to the uterus. Sperm must reach the egg somewhere along its journey to fertilize it, and once the two join, the fertilized egg will implant in the lining of the uterus, called the endometrium. The hormone progesterone causes the endometrium to grow and thicken, allowing the egg to successfully implant in the uterus. Once the levels of progesterone drop, the endometrium begins to shed from the uterus, which is known as menstruation, or more commonly, as a “period.”

## HORMONAL BIRTH CONTROL

In 1960 [3], the pill was introduced as the first hormonal contraceptive and is still considered the most widely used form of birth control in the United States [4]. The pill is an accessible and affordable way to prevent pregnancy. This form of birth control is well-tolerated by most women and

has positive health benefits. Hormonal contraception has now expanded to include the patch and the ring, as well as the pill. These three methods all have the same success rate at preventing pregnancy, which is 91% with typical use [5]. Hormonal contraception utilizes two active ingredients, estrogen and progesterone. These two hormones are naturally made by the body and controlled by the pituitary gland. When hormonal contraception is used, the pituitary gland sees that there are enough of these hormones in the body and does not signal the ovaries to make more. This prevents the release of the egg from the ovary, and thickens the lining of the uterus to inactivate the sperm. Because the ovaries also produce testosterone, this control of the ovaries decreases the amount of testosterone that is made, improving the amount of acne and facial hair that some women experience with diabetes.

## DIABETES AND HORMONAL CONTRACEPTION

Many women with diabetes may wonder if their birth control is safe to use, or if it will impact their diabetes control. Studies have shown that in low doses (35 micrograms of estrogen or less), all forms of hormonal contraception, including the pill, patch, and ring, did not increase blood sugar levels [6]. In women with type 1 diabetes, neither the HbA1C, nor the amount of daily insulin required, changed while using progesterone-only pills [7]. However, high dose combined estrogen and progesterone pills, and those containing desogestrel, a particular type of progesterone, did cause a slight increase in blood sugar levels. Low dose versions of the pill without desogestrel did not cause a change in blood sugar levels, nor HbA1c [7].

In women with type 2 diabetes, similar results were seen—only the pill with high doses of estrogen and progesterone, or the pill with desogestrel, seemed to affect blood sugar levels. In addition to stable blood sugar levels, the low dose version of the pill showed improved fat breakdown and healthier levels of triglycerides (fatty particles in the blood) [7]. This effect of lowering triglycerides could potentially improve other conditions, like high cholesterol or obesity commonly seen in women with type 2 diabetes.

The well-known complications of uncontrolled diabetes, such as retinopathy (eye disease) and glomerulopathy (kidney disease), are a long-term concern in patients with diabetes. However, the pill has not been shown to increase or decrease these problems in women whose diabetes is well-controlled [8, 9].

Though diabetes itself puts women at risk for complications, such as cardiovascular disease (stroke and heart attack) or DVT (blood clots in the legs), some research suggests that the pill may contribute to a slightly higher risk of these complications for women living with diabetes [10-11]. This risk is also seen with other forms of hormonal contraception [1]. However, pregnancy itself also increases these same risks [1]. The risks from pregnancy may be greater than the risks from taking the pill, especially in women with uncomplicated diabetes and an otherwise healthy lifestyle. When compared with pregnancy, taking the pill may be a safer alternative with more benefits, such as improved fat breakdown and decreased risk of developing cancer of the ovaries and uterus [1].

Women with multiple health problems, such as high blood pressure, obesity, high cholesterol, polycystic ovarian syndrome, or heart disease, should talk to their healthcare provider for personalized care in deciding which form of birth control would be the safest and most effective. Women who are over the age of 35 and smoke, or have a history of blood clots, should also discuss the risks associated with using any form of birth control containing estrogen, including the pill, patch, or ring with their provider [1].

### The Pill

The pill containing estrogen and progesterone is very popular in the United States and, once stopped, the ability to get pregnant returns very quickly. The pill must be taken every day at the same time to be most effective. The progesterone only pill, or the mini-pill, is also a daily tablet that must be taken every day at the same time to be effective with typical use. However, most women do not prefer the mini-pill as it does not provide the best control of their cycle and allows more bleeding in between periods.

Some women report side effects on the pill, but usually those symptoms improve with continued use. Some common side effects include headache, nausea, and irregular bleeding. However, some women also report benefits from taking the pill, such as improved acne, less ovarian cysts, and lighter menstrual cramps and blood flow during periods.

### The Patch

Like the pill, the patch also contains both estrogen and progesterone and prevents pregnancy in the same way. Instead of taking a pill at the same time each day, the patch is placed on the skin where the hormones are absorbed into the bloodstream. It is usually left on the skin for three weeks and then removed for one week to allow for menstruation.

Because it does not have to be taken every day at the same time, most women find that the patch is easier to use than the pill. Of the three options, the patch may provide the best cycle control with less spotting or bleeding in between periods [12]. For some women, it is also just as effective as the pill. Studies have shown that women with higher amounts of body fat may have a higher risk of becoming pregnant while using the patch than they would with another method, such as the pill [13]. For these women, the hormones cannot reach the bloodstream through the skin as effectively and do not control the ovary and endometrium as well as the pill would. The patch is also much more expensive than the pill.

Like the pill, the patch does not increase blood sugar [6] or HbA1c levels [7] in women with diabetes. Some studies suggest that there are no significant changes in insulin requirements for women with type 1 and type 2 diabetes when using the patch [7]. However, there is an increased risk of cardiovascular disease and DVT in women who are over 35 years old and smoke, or have a history of breast cancer [14].

### The Ring

Like the patch, the ring also contains estrogen and progesterone that is absorbed into the bloodstream, but instead of being absorbed through the skin, these hormones are absorbed through the vagina. Usually, the ring is inserted into the vagina for three weeks where it continuously releases hormones to stop the release of the egg from the ovary and prevent the endometrium from thickening. After three weeks, the ring is removed (it does not dissolve) for one week to allow for menstruation. When used correctly, it is just as effective as the pill and may be a good choice for women who have higher amounts of body fat, unlike the patch.

Because it is inserted into the vagina, some women may be uncomfortable using the ring and choose to use a different method of birth control. However, women who choose to use the ring may experience less vaginal dryness than those

who use the pill [12]. Though it is possible for the ring to be removed accidentally, it still prevents pregnancy as long as it is reinserted within three hours. If the ring has been removed for more than three hours, it is necessary to use a back-up method of birth control, such as condoms, to help prevent pregnancy [15].

## CONCLUSION

All women living with diabetes that could become pregnant should have a reproductive life plan. Hormonal contraception in the form of a pill, a patch, or a ring is safe for women with good glucose control, provides positive health benefits with few side effects, and is easily reversible. Although each of these forms of hormonal contraception will prevent most pregnancies, they do not prevent sexually transmitted infection or disease. Condom use is always recommended if you or your partner have more than one sexual partner. In Part Two of this series, we will explore long acting reversible contraception (LARC) and sterilization procedures.

For more information on reproductive life plans and a checklist to help you set your goals, please visit the CDC's Preconception Care website at <https://www.cdc.gov/preconception/overview.html>.

## CONFLICT OF INTEREST DISCLOSURES

The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. The authors report no potential conflicts of interest relevant to this article.

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