



**Media Contact:**  
*Kim Ozark, NOMOTC*  
*Executive Vice President*  
*248-231-4480*  
*ExecutiveVP@nomotc.org*  
*www.nomotc.org*

## **Incidence of Multiple Births and birth types**

The rate of identical twins is constant at approximately four per thousand. It is remarkable that the incidence of identical twins remains the same no matter where a person lives, and it has remained the same throughout history. The rate of fraternal twins, on the other hand, can change depending on where a person lives, the mother's age, etc. Fraternal twins account for the differences in the twin rate, the fraternal rate being approximately 22.8 per thousand in the world. Any given mother would have a better chance of having fraternal twins, as there are two thirds more fraternal or dizygotic twins than identical or monozygotic twins. However, your own chance of having twins depends on your personal history, age, race, and many other factors.



### **Factors Affecting the Twinning Rate**

Fraternal twins tend to run in families. Most identical twins happen by "chance" and can happen to anyone. However, some new research has shown a "male factor" that may contribute to identical twinning. Many people believe that twins "skip a generation." Twinning is passed on as a genetic trait and appears in the women only. If you are a female and your mother had fraternal twins, you would have an increased chance of having fraternal twins yourself. Your brothers would not have an increased chance of having fraternal twins themselves, but they may pass the genetic trait on to their daughters who would then have an increased chance of having twins. This makes it appear that twins skip a generation. It is well known that fertility treatments can cause multiple births. This affects mainly the rate of fraternal or dizygotic twins. These methods use many different types of drugs and treatments. Most of them rely on stimulating ovulation with hormones or, more recently, inserting fertilized eggs into the mother's uterus (womb). Fertility treatments were not thought to cause identical or monozygotic twins, however new reports show an increase in the identical twinning rate, especially with IVF (In-vitro fertilization). There are also many other factors that increase the rate of fraternal births. They include social habits, maternal age, number of pregnancies, geographic location, seasons, and nutrition.



The incidence of fraternal twins varies by race. Africans have a higher rate, about 16 per thousand, and Asians have the lowest rate, about three per thousand. The rate in Caucasians is about eight per thousand. In the United States the Hispanic twinning rate (20.1 per 1,000) is substantially lower than the rate of non-Hispanic whites (31.5 per 1,000) and that of non-Hispanic blacks (32.1 per 1,000). A well-known tribe in Africa called the Yorubas has the highest twinning rate in the world, one in 22. This increase is due to fraternal twinning, as their rate of identicals is the same as the rest of the world. Their diet consists of large amounts of a particular species of yam (*Dioscorea rotundata*). This yam contains a high level of a substance similar to the hormone estrogen, which is thought to bring on multiple ovulations. The older one is, the higher one's chance of having fraternal twins. The twinning rate is doubled for ages 35 to 40 and then decreases again, probably due to a decrease in fertility as one ages.

The rate increases again for the age group 45 to 49 years. Older women are having multiples at an increasingly high rate. Since 1990, the twin birth rate has risen 80 percent among women 40-44 years of age (from 24.7 to 44.5 per 1,000) and almost 600 percent among women aged 45-49 compared to only a six percent rise for women under age 20. There were more twins born to women ages 45 to 49 in 1997 than during the entire decade of the 1980s. This, however, accounts for only five tenths of one percent of all twins born, reflecting the relatively fewer births in older women. In other words, you are less likely to give birth over the age of 45. But if you do, there is a 33 percent chance that it will be a multiple birth. Being well nourished increases the chance of twinning, but the rates drop off with malnutrition. Certain social habits, such as eating certain yams grown in Africa, can increase your chances of twinning. The more pregnancies you have had, the greater are your chances of having fraternal twins. By your fourth or fifth pregnancy, your chance of having twins is four times higher than for your first pregnancy.

Geographically, rates of fraternal twins are greater in northern areas than in those located in the farther south. Also, different races and countries have varied rates of twinning. In the United States, Massachusetts and Connecticut reported the highest proportion of twins, 25 percent higher than the U.S. rate, while Nebraska and New Jersey had twice the national level of triplet and higher births.



# Types of Twins

There are two basic types of twins: monozygotic, commonly referred to as identical twins and dizygotic, referred to as fraternal twins. There are also other rare and unusual types of twins, such as polar body twins. The specific cause of twinning is still a mystery.

## Identical Twins

Identical, or monozygotic, twins develop from one fertilized egg (mono=one, zygote=egg). This egg divides into two individuals who will share all their genes in common. No one knows what causes the egg to divide in half. These twins are genetic clones of each other. They will therefore always be the same sex and have identical features, eye and hair color. Their handprints and footprints are similar, but the fingerprints are different. This type is what most people think of when they think of twins.

## Fraternal Twins

Fraternal, or dizygotic, twins develop from two eggs (di=two, zygote=egg) that are fertilized separately by two different sperm. This usually happens when the mother produces more than one egg at ovulation. These two fertilized eggs develop separately and have their own unique genes. They are no more alike than genetic single-birth brothers and sisters. Dizygotic, or fraternal, twins may be the same sex or opposite and may appear similar or look completely different. They may have different hair and eye colors and be different sizes. Some may not even appear to be related!

## More Than Two

Higher order multiples can be triplets which consist of three babies; quadruplets (or quads) which are four babies; quintuplets (or quints) which are five babies; sextuplets which are six babies; or septuplets which are seven babies. These are all referred to as higher order multiples (HOMs) or supertwins. Higher order multiples can be any combination of the two basic twin types.

## Quadruplets

There can be different types of quadruplets just as there are different types of triplets. There can be any combination of fraternal and identicals within the four. According to data from the [Triplet Connection](#) and [Mothers of Supertwins \(MOST\)](#), close to 60 percent of the families registered with these organizations have a combination of identical and fraternal children. Many of the other higher order multiples result from multiple ovulations and thus are fraternal. Identical quads, where all four are genetically identical, is extremely rare.



## Unusual Types of Twins

In addition to all the different combinations of identical and fraternal multiples, there are some rare types of twins.

### **Mirror-image Twins**

Mirror-image twins occur only in identical twins. In approximately 23 percent of identical twins the egg splits later than usual, most often day seven or beyond. The original right half of the egg becomes one individual and the original left half becomes the other. These twins will often have "mirror images" of their features, such as hair whorls that run clockwise in one and counter clockwise in the other, a birthmark on the right shoulder of one and the left shoulder of the other, etc. There is no specific test for determining if twins are mirror-image. The determination is made by observation only, and the twins must be monozygotic, or identical.

One twin will be right-handed, while the co-twin is left-handed. This may be a partial explanation for the fact that a little over one third of identical twins are left-handed, double the rate in the general population. In extreme cases, all of the internal organs are reversed in one of the twins, with the heart on the right, the liver on the left and the appendix on the left.

### **Polar Body Twins (Half Identical)**

Polar body twinning is very unusual and very rare. The process is quite complicated. The polar body appears when the egg has been developing, even before fertilization. It is a small cell that does not function and will usually degenerate and die. It is thought that in some cases, when the egg is old, the splitting off of the polar body takes place in an abnormal way. It then becomes larger, receives more nourishment, and does not die as it usually does. Instead, it acts as a second egg. The polar body and the egg share identical genes from the mother, but they may then be fertilized by two separate sperm from the father. This will result in twins who share half their genes in common (from the mother) and the other half different (from the two sperm). They share some features of identical twins and some features of fraternal twins and thus are called half-identical twins.

### **Mixed Chromosomes or Chimerism**

Another form of twinning that has been identified is called chimerism. This is thought to occur if two separate sperm fertilize two separate eggs which then fuse, producing individuals with different sets of chromosomes. Some have been identified that have more than one distinct red blood cell type and individuals who are both XX and XY (the sex chromosomes - XX being female and XY being male.) This phenomenon might also be associated with fused placentas causing intermixing of the circulations. It is very rare, and fewer than twenty-five cases have been identified. It is more common in other mammals, such as calves.

### **Superfecundation**

Twins can have different fathers. One well-known case was described in 1810 in the United States. A woman had both a white and a black lover, and she became pregnant and gave birth to twins, one white and the other black. Each twin had a different father. This is called superfecundation. It happens when the mother ovulates more than one egg and has more than one partner during her fertile period. One egg is fertilized with sperm from one partner, and the other egg from sperm of the second partner. These types of twins are always fraternal or dizygotic.

## **Superfetation**

Superfetation occurs when a woman ovulates more than one egg but the eggs are released at different times, sometimes up to 24 days apart, and they are fertilized when they are released. The resulting twin pregnancy has different conception dates, so the babies may be quite different in size. Days or weeks may separate the births. It is quite an unusual event. In some cases, the births of twins may be weeks or months apart due to deliberate medical intervention. This is called interval birth. In addition to all the different combinations of identical and fraternal multiples, there are some rare types of twins.

## **Causes of Fraternal Twinning**

It is felt that fraternal twins are conceived due to higher levels of Follicle Stimulating Hormone (FSH) in the mother. This hormone stimulates the growth and ripening of eggs. Mothers of fraternal twins tend to have increased height and weight, earlier start of the menstrual cycle, and shorter menstrual cycles, all of which are probably hormone-related. Once you have had fraternal twins, your chance of having another set of twins is three to four times that of the general population.

Often, there are other female relatives who have conceived twins as well. Therefore, this tendency to have increased FSH, and as a result fraternal twins, is thought to be inherited. Also, as women age, their FSH naturally rises. Therefore, the incidence of fraternal twins is very common in older moms, especially over the age of 35.

The ability to conceive fraternal twins has ethnic differences also. Fraternal twinning is most common among African-Americans and less common among Asian populations.

## **Causes of Identical Twinning**

It is not really known how identical twinning occurs, but there are some theories. One theory is that it may be related to aging of the egg after ovulation: an "over-ripe" egg. Another theory states that since the rate of identical twins is higher in mothers who are either very young or very old, identical twins may be due to the hormonal imbalances seen at these ages. Supporting this, mothers of identical twins have been shown to have an earlier menopause, which is also due to hormones.

The rate of identical twinning is fairly constant in different countries and ethnicities, unlike the rate of fraternal twinning which is very different in different cultures and races.

Some new research has shown a "male factor" that may contribute to the rate of identical twinning. Identical twinning has been found to run in some families through the male line of the family.

Having two sets of identical twins would be a rare occurrence. The odds of having more than one set of identical twins are at least one in 70,000

## **Complications in Identical Twinning**

It is possible to have more complications with identical twinning because of the unusual splitting that takes place in the egg that produces identical twins, but most of these complications are rare. One type of problem is Siamese or conjoined twins, in which the twins are connected in various parts of their bodies. This happens only in identicals. This condition is rare and happens in one out of 33,000 births, with most conjoined twins (about 70 percent) being female. Also, Twin-to-Twin Transfusion Syndrome (TTTS), a major cause of morbidity and mortality in twin pregnancies, only occurs in identical twins who share one placenta. For more information on this condition, contact the [Twin To Twin Transfusion Syndrome Foundation](#) and [Fetal Hope Foundation](#).