

Fertility Apps Do not Help You Get pregnant

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Beyond Regular Intercourse

Many women use fertility apps to track their menstrual cycle and time intercourse. Tracking cycles, using apps as method of registering when the cycle started and ended is fine. The use of apps to time intercourse is not supported by any scientific evidence. We know for a long time that conception is likely to occur when exposure to sperm takes place in the six days that end in ovulation.

Why Fertility Apps are Unlikely to be Helpful

An analysis of large number of apps and websites indicates that only a minority will yield that fertile window and thus are unlikely to help women get pregnant.

Variation in the length of menstrual cycle 21 to 35 days will also means that ovulation day is very difficult to predict with methods readily available for women. Early ovulation (day 6 or 7 of the cycle) as well as late ovulation (day 18 to 20) will be missed. Conception will be a possibility in these cases for women having regular intercourse.

Sperm survives for at least 3 days. The WHO in a large study indicates that intercourse 3 times a day yields highest pregnancy rate among normal couples. Conceptually if you have intercourse 3 times a day, after menses, you have exposure to sperm all the time and there id no need to time ovulation. More accurate timing of ovulation using many self administered

methods has so far to demonstrate increase in pregnancy rate. More recently survey of more technology mediated methods also failed to show an increase in pregnancy rate beyond regular intercourse.

Effectiveness of Fertility Apps

Beware of many writings about [fertility apps](#), what do they do and what do they do not do...They miss the most important piece of information. Do they enable you to get pregnant at higher odds than those not using the app? And of course they cannot accurately answer that question as they did not do the research that prove an improvement in pregnancy rate. Many articles about fertility apps start with the narrative assumption that they are effective without offering a reference or proof.

One recent scientific survey of over 50 apps indicated that most of them even miss the fertile period. Insisting on intercourse at a specific day is not helpful also can impair performance in men.

How Long Have you Been Trying to Conceive (TTC)

It's exactly how long have you been having intercourse not protected by a birth control (pills, condom), irrespective of use of apps or any other method of timing ovulation. Not accounting for this period, artificially shorten the duration of infertility and delay seeking medical care.

It's great to use technology when it helps, it gives women a sense of empowerment. But when technology is not proven to be helpful then simple proven solutions should be used.

Possible Harm Caused by Using Apps

When you use fertility apps alone to conceive you are in effect

1. Depriving yourself of other fertility tests. You will not

know if your partner sperm is normal or if your Fallopian tubes are open. Your egg reserve is also not evaluated. All these factors are important for decision making about fertility and how long you should continue to try using the app. For example, if your tubes are blocked or your husband sperm is low intercourse close to your ovulation will not be helpful leading to more time wasted and no improvement in chance of conception.

2. Preconception testing and counseling performed at initial fertility evaluation is skipped. That means the risk of common genetic and other diseases are not tested for e.g cystic fibrosis, sickle cell disease, spinal muscular atrophy, Ashkenazi Jewish Profile and others. These increase the risk of transmission of genetic diseases to the baby. Other infectious diseases are not tested for too e,g hepatitis, immunity to Rubella and chicken pox.

3. [Serious security and privacy flaws has been cited for some fertility apps](#). Fertility apps ask users for intimate details including weight, sex life, pregnancy, miscarriage.. [A recent consumer report](#) indicated that someone with no hacking skills can access all these data. Data are also shared without permission with other apps

Do not use apps and have regular intercourse 3 times a week. Fertility Apps Do not Help You Get pregnant beyond Regular Intercourse and Delay a Complete Fertility Testing.

What is my Chance of

Delivering a Baby without Fertility Treatment?

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Women may ask what are my odds of delivering a baby in the next 12 months without any fertility investigation or treatment?

Let me start by saying that a consultation with a reproductive endocrinologist can help you identify any fertility factors unknown to you. Moreover, evaluation of your ovarian reserve can give you an estimate how long can you continue to try. Safety is another aspect of consultation as it can identify medical, obstetric and genetic risk factors to having a baby.

Chance of Spontaneously Pregnancy in One Year (treatment independent)

Ignoring all these aspects, the chance of getting pregnant with intercourse alone, within one year, is strongly related to age. Data from The American Community Survey (ACS) and National Center for Health Statistics (NCHS) based on study of millions of American women can provide an approximate answer.

If one 100 women living in The US tried to conceive, the odds of giving birth in the coming 12 months based on their age group would be

Age (y)	ACS (%)	NCHS (%)
20-24	21.5	23.2

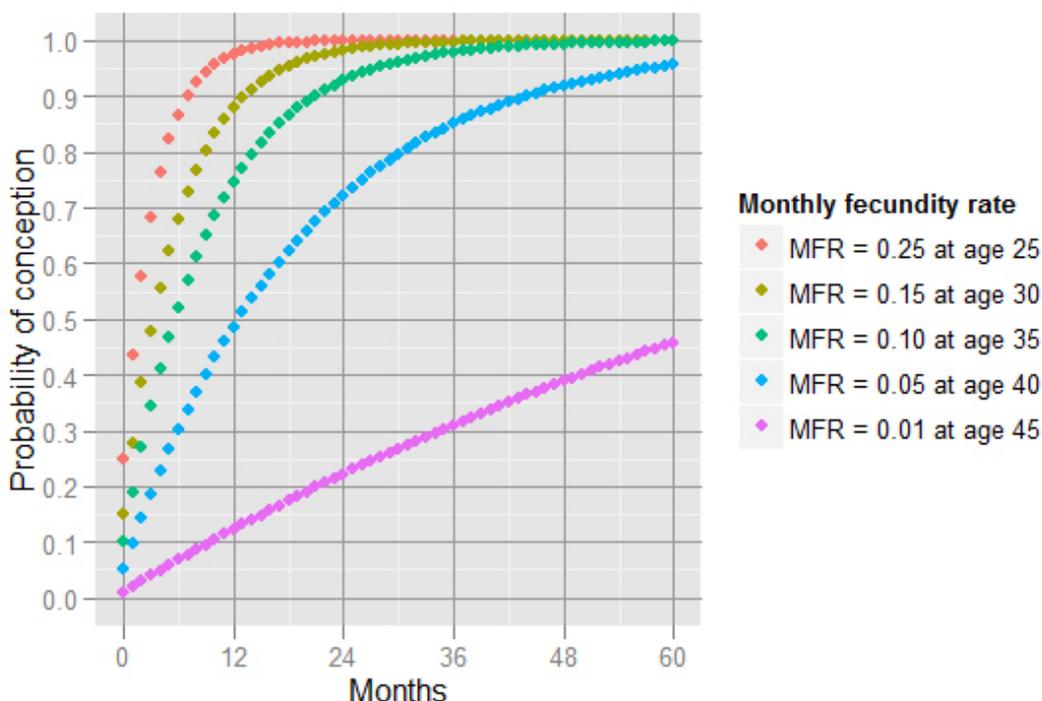
25–29	26.9		
	28.4		
30–34		25.6	26.6
35–39		11.9	14.5
40–44		2.8	5.0
45–50		1	2.3

[ACS American Community Survey 2012.](#)

[NCHS National Center for Health Statistics 2013.](#)

Monthly Fecundity Rate

The odds of getting pregnant and delivering a child each month is also a function of age.



The Monthly Chance for Conceiving and Delivering a

Live Born is Related to Maternal Age

One other aspect to consider is how long have you been trying = how long have been having intercourse with no birth control methods (irrespective of timing of intercourse or any other arrangements). The longer you have been trying with no success, the lower the chance for spontaneous conception.

The chance for spontaneous conception can give women realistic guidance of their odds for spontaneous pregnancy with time and minimize delay in seeking fertility consultation that can be detrimental to future fertility.

Hepatitis B: what do you need to know if trying to conceive

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Hepatitis B is relatively common in the US and worldwide. There are approximately one million individuals living in the US with chronic hepatitis B. According to the CDC, the highest rate of infection occurs among those 20 to 49 years old. Approximately 5% to 10% of adults and children older than age 5 with hepatitis B infection go on to develop chronic infection. Globally, 350 million individuals live with chronic hepatitis B infection, according to WHO and other sources. One third of those infected reside in China ([\[link\]](#)). It is more common in Asia, Saharan Africa and some areas in South America. Migration and medical tourism may increase the magnitude of hepatitis B problem in the US. In Asian countries the prevalence is slightly higher in men and is about 10% of adult population. Universal vaccination of all infants at birth and vaccination of at risk individuals e.g type I and II diabetes, sex partners of hepatitis B infected individuals, men who have sex with men, travelers to high risk areas, can prevent transmission of hepatitis B.

Reproductive endocrinologists and fertility specialists are responsible for detection of hepatitis B in partners and prevent the transmission of hepatitis to non infected partner and newborn. Women and men are tested for hepatitis B at the time of initial fertility consultation. Abnormal results are interpreted and measures are taken to avoid transmission to others, during natural conception and with the use of assisted reproduction (IVF).

Hepatitis B Discordant Couples Discovered Prior to Fertility Treatment

One of the major means of transmission of hepatitis B is sexual intercourse. At initial consultation if one partner is hepatitis B Surface antigen positive (HBsAg) indicating chronic infection, vaccination of the other partner will most likely prevent the transmission of hepatitis B during attempts of natural conception and fertility treatment. The vaccine is administered three times at 0, one month and 6 months. High levels of Hepatitis B surface antibody (anti-HBs) indicates immunity.

During fertility treatment, when the male partner is infected and female partner is not, modification of sperm washing techniques minimize the risk of hepatitis B transmission. These include separation of sperm from seminal fluid and then testing of the sperm for hepatitis B before use IUI or intracytoplasmic sperm injection (ICSI). The use of ICSI may reduce but not eliminate the transmission of hepatitis B virus (controversial).

Prevention of Hepatitis B transmission from Egg Donors

Egg donors are initially screened through careful history to exclude those exposed to risk factors, then a complete physical examination. They are also initially screened for viral infections including hepatitis B. Within one month of egg retrieval, donors are retested using conventional labs as well as DNA based testing for hepatitis B (and hepatitis C and HIV) to further minimize the risk of transmission.

Prevention of Hepatitis B transmission

from Sperm Donors

Sperm donors undergo a careful questionnaire related to risk factor, followed by examination and laboratory screening. Sperm is obtained and frozen and quarantined. Donors are then retested using FDA approved laboratories to further minimize the risk of transmission of infectious diseases including hepatitis B.

Prevention of Hepatitis B transmission to Gestational Carriers

Male and female partners (intended parents) are tested in a manner similar to sperm and egg donors. If testing was not possible, the carrier is carefully counseled that FDA mandated testing is not followed. In case of a hepatitis B carrier partner, the carrier is vaccinated prior to transfer of embryos.

Low Temperature Storage of Cells & Tissue from a Hepatitis B infected individual

There were few reported cases of transmission of hepatitis B from frozen tissue. Those cases did not involve sperm, eggs or embryos. As a precaution, reproductive cells from infected individuals are frozen in separate tanks than those not infected. More recently, the use of closed systems that do not allow cells to touch liquid nitrogen in the tank, the use of nitrogen vapor instead of liquid and the sterilization of nitrogen using ultraviolet rays can further minimize the risk of transmission.

Hepatitis B Discovered During Pregnancy

A hepatitis B infected mother have a small risk of transmission of the virus to the fetus during pregnancy. The risk of transmission, however, is significant at the time of delivery. Sometimes medical treatment of mothers is indicated

with anti-viral medications to minimize this risk after consultation with a maternal and fetal medicine specialist.

All newborn to a hepatitis B infected mother should receive at birth

i. Hepatitis B immune globulin (HBIG) to neutralize a virus acquired from the mother and ii. Hepatitis B Vaccine to produce long term immunity.

Careful screening of intimate partners, egg and sperm donors can markedly reduce the chance of hepatitis B transmission during natural conception and IVF.

[Preconception Checklist](#)

Preconception Checklist

What should you do if you decided to get pregnant?

Start prenatal vitamins : one tablet per day. Make sure that It contains 1mg of folic acid and has 5000 units (not more) of vitamin A

Visit your gynecologist : for history, exam, pap test and vaccination history.

Preconception labs : to assess the safety of pregnancy. Tests should include hepatitis B surface antigen, hepatitis C antibody, HIV, blood type, blood count, prolactin, TSH (thyroid function), cultures for gonorrhea and Chlamydia.

Genetic screening : to assess the carrier state of the parents for common genetic diseases and the risk for transmission to children. Basic tests include common mutation for cystic fibrosis, spinal muscular atrophy and fragile X syndrome. Additional tests are related to ethnicity: hemoglobin abnormalities in blacks, Mediterraneans and Asians, Ashkenazi profile for European Jews, Tay Sach disease for Jews and French Canadians. Another approach is to apply a 'universal genetic test' that encompasses a large number of genetic mutations for many diseases irrespective of ethnicity to allow for detection of rarer genetic diseases or even to sequence the whole genes related to these diseases.

Lifestyle factors : better nutrition e.g one serving of small fish per week , stop smoking, avoid alcohol and reduce exercise if doing strenuous training

Worried? have a risk factor? or wants a more proactive approach?: Obtain a sperm analysis, HSG to test if the tubes are open and ovarian reserve tests to investigate the function of the ovaries (vaginal ultrasound and blood work).

Intercourse: have regular intercourse three times a week without attempting to monitor or to time ovulation.

For How Long should you try to conceive before moving to the next step?

a. If a fertility factor known or detected e.g abnormal sperm analysis, blocked fallopian tube, no ovulation, low ovarian reserve, carrier of genetic mutation... you should seek consultation with a reproductive endocrinologist

b. If no fertility factor is known:

1. Female age < 35 years try to conceive for one year before seeking consultation with a reproductive endocrinologist

2. Female age \geq 35 years seek consultation within 6 months if

not pregnant

Sperm Analysis in Natural and Assisted Conception

Sperm analysis is the initial test for evaluation of male fertility. Components of **sperm analysis** include volume, count (concentration), movement and shape of sperm cells.

Normal Sperm Analysis

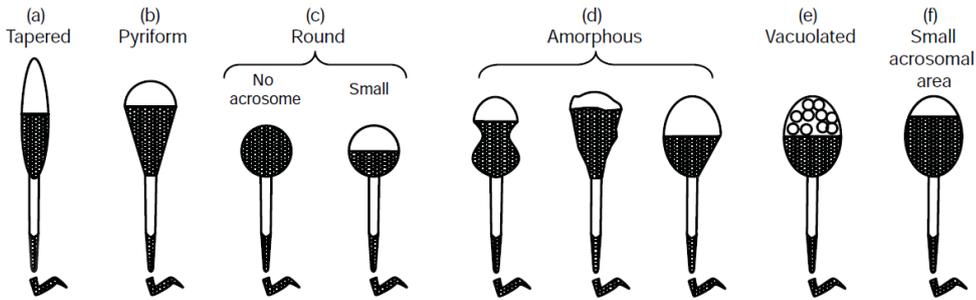
Sperm volume: the total amount of fluid produced. Commonly 1.5 mL or more.

Sperm count: number of sperm in each mL of fluid. Normal concentration is 15 to 20million per mL. Total count= volume x concentration (count).

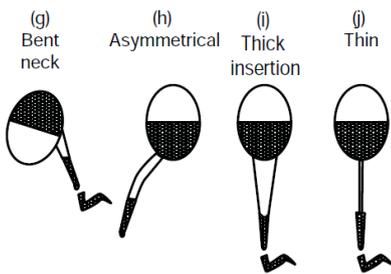
Sperm motility: % of sperm with vigorous or moderate movement.
Total motile sperm count=volume x concentration x %motility

Sperm morphology: Shape of sperm using strict (Tygerberg, Kruger) criteria 4% normal or more

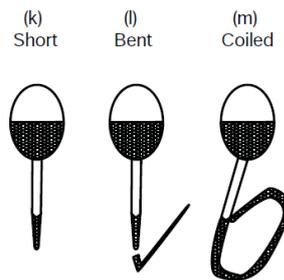
A. Head defects



B. Neck and midpiece defects



C. Tail defects



D. Excess residual cytoplasm



Strict Sperm Morphology

Lower reference limits for men whose partner conceived within 12 months after stopping use of contraception had the following parameters (WHO manual , 5th ed.) are:
 Semen volume (ml) 1.5 (1.4–1.7)

Total sperm number (10^6 per ejaculate) 39 (33–46)

Sperm concentration (10^6 per ml) 15 (12–16)

Total motility (PR + NP, %) 40 (38–42)

Progressive motility (PR, %) 32 (31–34)

Vitality (live spermatozoa, %) 58 (55–63)

Sperm morphology (normal forms, %) 4 (3.0–4.0)

All parameters should be interpreted in conjunction with clinical information. If abnormal it can be repeated in 2 to 3 months.

How much sperm is enough?

Evaluation of male fertility through sperm analysis is complex. Clinical factors in history and examination should be considered. Total sperm count in the specimen is an important

factor e.g low sperm morphology in specimen of 200 million sperm may have a different effect than low morphology in a specimen of 30 million sperm. Although there are notable variations in a sperm sample of the same man over time, there is no evidence that repeat evaluation of semen is helpful in managing infertility in a female partner.

Since we have very limited tools (medications, supplements, surgery) to meaningfully improve sperm parameters and fertility, a practical management of fertility due to male factor is:

>10 million motile sperm: suitable for natural conception and IUI

2-10 million motile sperm: suitable for IVF

<2million motile sperm or strict morphology <2% suitable for IVF with ICSI (intracytoplasmic sperm injection)

IVF + ICSI is indicated if surgical sperm harvest is needed and some cases of retrograde ejaculation and anti-sperm antibodies.

Can the sperm analysis be improved?

The count, motility and morphology can sometimes be improved (lifestyle modifications, medicine, surgery). Two important tips to consider though

a. In the majority of cases, there is no evidence that this improvement increases the odds of a pregnancy in female partner

b. The delay in treatment is sometimes critical for women with low egg reserve while they wait for their partners to improve their sperm parameters

Is it safe for women to get pregnant after breast cancer treatment



Pregnancy after breast cancer treatment

After treatment of breast cancer to the satisfaction of her oncologist, should a woman who desire to get pregnant be discouraged from doing so? A very critical question considering the fact that there are close to half a million breast cancer survivors living in the US and are in the childbearing age.

Is it safe for women to get pregnant after breast cancer treatment?

For a very long time, counseling of women regarding pregnancy was dependent on the fact that estrogen increases during pregnancy and because estrogen has some effects on both estrogen receptor positive and estrogen receptor negative breast cancers, its probably better if women avoid pregnancy- unless of course another woman is carrying for them, a gestational carrier. This recommendation is not based on strong scientific evidence.

Safety of pregnancy after breast cancer treatment. All the published reports included a total of 1417 women who got pregnant after breast cancer treatment and 18059 who survived breast cancer and did not get pregnant. **Women who got pregnant**

following breast cancer diagnosis had significantly better survival compared to women who did not get pregnant. In fact, those who got pregnant were more than 40% less likely to die because of breast cancer.



Pregnancy after
breast cancer
treatment

Important caveat to these studies is the healthy mother bias—the tendency of healthier women to desire and attempt pregnancy and the less healthy women to avoid pregnancy. This may inflate the safety of becoming pregnant after breast cancer treatment. Studies also largely did not address the chance for recurrence. Nevertheless, no study showed detrimental effect in breast cancer survivors who become pregnant. The largest of these studies published by The Danish Breast Cancer Cooperative Group was a population based study and included over 10,000 women who survived breast cancer and were under the age of 45. Three hundreds and sixty-seventy one women experienced 465 pregnancies and 236 deliveries. Women who got pregnant—full term or spontaneous miscarriage, were at least 30% less likely to die from breast cancer. Women with low risk breast cancers enjoyed 45% higher chance for survival after full term pregnancy than similar women who did not get pregnant.

How long should women wait after breast cancer treatment before attempting pregnancy? The majority of experts recommend waiting for about two years as the majority of recurrences takes place within this period. There are differences in recurrence pattern, however, between estrogen receptor negative and estrogen receptor positive tumors. Estrogen receptor negative tumors are more common in younger women and tend to recur earlier-within 2years after treatment. Recurrence of estrogen receptor positive cancers remain as high as 4-5% per year for about 15 years.

Pregnancy in BRCA1 and BRCA2 mutation carriers. In BRCA1 pregnancy does not seem to increase the risk of early onset breast cancer. In BRCA2 carriers, pregnancy may cause a borderline increase in risk of breast cancer before 50, especially when first pregnancy after age 40.



Pregnancy after breast cancer treatment

Breast feeding is recommended whenever possible in women treated for breast cancer, even if they are BRCA carriers and does not appear to impact breast cancer prognosis and may even be protective in some cases.

Contraception. If pregnancy is not desired as during breast cancer treatment and the follow up period after treatment non

hormonal contraception is recommended such as IUD or barrier method e.g. condom. BRCA1 carriers may show an increased risk for early onset breast cancer if they use oral contraceptive pills before the age of 30 or for more than 5 years.

Young women diagnosed with breast cancer are commonly very concerned about their future fertility and safety of pregnancy after treatment. Proper counseling enables them to make appropriate decisions about future reproduction and fertility preservation. At the end of the day, most of the breast cancer battles will be won, some will be lost, pregnancy does not appear to contribute to that loss.

Ovarian Cysts and Fertility

Ovarian cysts are very common during reproductive age women. The cyst has a wall and is full of fluid. Very few of ovarian cysts are cancer after puberty and before menopause. The two most common types are **follicular cysts** and **corpus luteum cysts**. These are the result of follicle growth in the ovary (the sac that contains the egg) that either a. does not release the egg and continue to grow or b. releases the egg then the follicle wall now called the corpus luteum closes and reform a cyst. The vast majority of these cysts require just observation as they resolve on their own.



laparoscopic surgery for endometrioma may reduce ovarian reserve

The other two common benign cysts are dermoid cysts and endometriomas. **Dermoid cyst** is a developmental cyst that are commonly found in young women. It is very rare for them to become cancer. Larger cysts can twist and become painful as they twist the blood vessels of the ovary. This needs prompt medical attention. **Endometriomas** are benign cysts full of old blood. The wall of endometrioms is similar to the lining of the uterus-endometrium. They sometimes cause pelvic pain.

Benign tumors of the ovary can also include **serous or mucinous cysts**, they contain thin or thick fluid, respectively. They rarely become malignant. **Border-line ovarian cysts** exhibit more activity of the cells lining the cyst wall but lack the invasion seen in cancer. **Malignant cysts** do exist but are not common before the age of 40.

Evaluation of ovarian cysts include clinical history, pelvic exam, careful ultrasound, color doppler to study blood flow into the cyst and blood work to assay tumor markers. Vaginal ultrasound, can in expert hands, delineate the characteristic appearance of the cyst and can reach an accurate diagnosis in 90% of dermoid cysts and endoemtrioms. Sometimes a follow up of six to eight weeks is needed as the majority of follicular and corpus luteum cysts will disappear during this period. Larger cysts that do not appear during that period may require surgical evaluation, usually using minimally access surgery-laparoscopy.

Fertility preservation in women diagnosed with ovarian cysts. The most important initial task is to exclude malignancy in an ovarian cyst.

Benign cysts— can be managed using *observation* every 6 months or ovarian *cystectomy*. Ovarian cystectomy entails making a cut in the ovary and removal of the cyst and the cyst wall. **Removal of the cyst wall, inadvertently remove some of the adjacent ovarian tissue. Sometimes that impairs the future function of the ovary and reduces ovarian reserve and possibly**

the chance of future pregnancy. This is especially true if the surgery has to be repeated in the future or needs to be done on both sides. If the type of cyst is known with high degree or certainty as in the case of dermoid cysts and endometriomas, the cysts are small and not causing any complaints, young women can elect to observe them until they complete their family. If ovarian cystectomy is planned, discussion of the effects on ovarian function should be initiated as well as evaluation of ovarian reserve before and after surgery. Ovarian stimulation and egg or embryo freezing can be accomplished prior to surgery. For some women, ovarian tissue freezing can also be performed at the time of surgery.

Borderline ovarian cysts. Borderline ovarian cysts can be treated with cystectomy-removal of the cyst, oophorectomy-removal of the whole ovary or hysterectomy with removal of both ovaries. There is no evidence that one treatment is better than the other in terms of survival. For women who desire future fertility removal of the cyst only is a viable option. If the ovary need to e removed, ovarian stimulation, egg retrieval and embryo or egg freezing can be performed prior to surgery.

Malignant ovarian cysts. Malignant ovarian tumors limited to one ovary, can be treated by removal of that ovary with preservation of the uterus and the other ovary. Unfortunately, those that spread beyond the ovary may require hysterectomy and removal of both ovaries.

If you have an ovarian cyst and surgery was recommended, consultation with a reproductive endocrinologist and oncologist or gynecologist can clarify possible effects of surgery on future fertility. Women then will have the opportunity to understand fertility preservation options available for them.

Trying to Conceive (TTC): What Does Timed Intercourse Means?

If you are trying to conceive (TTC) there is one thing you need to do as it is very helpful in achieving a pregnancy.

There are also few things that are not very helpful.

Timed Intercourse : How to do it?

The majority of pregnancies take place when intercourse takes place in the six day and especially two day period ending in the day of ovulation (fertile window). Some advice that ovulation should be timed using cervical mucus, basal body temperature or urinary luteinising hormone (LH) kit. Several factors are against this approach:

1. Timed intercourse is emotionally stressful
2. Sperm survive in the cervix, uterus and fallopian tubes for several days (>3 days, close to 7 days)
3. Studies that evaluated the use of mucus, BBT or LH kits to time intercourse did not report better odds for natural conception.

The best approach to a timed intercourse is not to time it at all provided that sex is frequent enough to maximize the chance for sperm-egg interaction. Intercourse three times a week appears to optimize the chance for natural conception.

It is not true that frequent **intercourse** reduces the pregnancy rate due to reduced sperm count and quality.

Timed Intercourse : How long?

Approximately 85% of women trying to conceive conceive within the first year. [The American Society for Reproductive Medicine](#) recommend seeking consultation if pregnancy does not ensue after one year of intercourse in women younger than 35 years and six months in women 35 years and older.

The limited Value of Cervical mucus, BBT and LH kits

Cervical mucus, BBT and LH kit are not accurate methods to **time ovulation**. Fluid cervical mucus, rise in temperature and positive urine LH can take place without ovulation or several days before ovulation. Studies evaluating these methods did not find an increased chance for pregnancy. Using a calendar or *App* to register symptoms and mucus was not scientifically evaluated.

For a minority of couples that cannot have frequent sex (every 2 to 3 days) the use of LH kits maybe helpful. All the other methods (mucus, temperature) had less than 50% correlation to ovulation.

Fertility Apps



Fertility Apps

Fertility apps are generally not helpful in enhancing fertility because they are not based on scientific information. The premise that cervical mucus character, urine LH kit and BBT charts are better than frequent intercourse is not scientifically correct. Thus apps based on tracking ovulation cannot contribute to your fertility beyond intercourse three times a week. No app so far was scientifically tested and was shown to enhance fertility in women or men.

Conclusion: Do have intercourse three times per week after the end of bleeding days. Do not time intercourse. If you must use urine LH kit. If you do not conceive in 6 months ($\geq 35y$) or a year ($< 35y$) consult with a reproductive endocrinologist. Throw your iPhone or keep it and delete the app (till a truly helpful app is available).