



## IVF Supplements

Various supplements may be recommended prior to IVF to help improve ovarian response to stimulation and/or egg quality. Higher quality eggs have a better chance of fertilizing and resulting in high quality embryos. Higher quality embryos in turn have better chances of implantation and lower chances of miscarriage.

### DHEA

Women with diminished ovarian reserve (low AMH and antral follicle count) and advanced maternal age often have abnormally low levels of androgens. It may be surprising, but research suggests that low androgen levels are detrimental to a woman's fertility, and higher androgen levels are beneficial to the healthy development of eggs. A DHEA supplement provided to women with lower ovarian reserve can raise androgen levels and improve the environment in which eggs mature.

Possible benefits of DHEA supplementation also include: Improved overall feeling, feelings of improved physical strength, mental acuity and memory, improved sex drive, improved IVF pregnancy rates, increased chances of spontaneous conceptions, higher egg and embryo quality, lower chances of miscarriage and decreased chromosomal abnormalities in embryos (aneuploidy).

Possible Negative side effects of DHEA include: Oily skin, acne, hair loss, stomach upset

It is recommended to take DHEA in the evening with food. If stomach upset persists, please speak to a nurse at the Kelowna Regional Fertility Centre as DHEA can be taken in a divided dose.

### CoEnzyme Q10

Coenzyme Q10 is a naturally occurring fat-soluble nutrient that is essential for energy production. It is a powerful antioxidant and cell membrane stabilizer that works within the mitochondria (cellular power stations) in the cells. All normal tissue manufactures its own Coenzyme Q10, however, this production decreases naturally with age.

The oocyte (female egg) is the largest and probably most sophisticated cell in the human body, with the highest concentrations of mitochondria of all body cells. It uses immense amounts of energy in the process of maturation and ovulation. Therefore, research suggests that Coenzyme Q10 supplementation may act like a battery pack for our eggs improving cellular energy and possibly the number of oocytes recruited for women with decreased ovarian reserve. This can lead to improved egg and embryo quality. Commercially, Coenzyme



Q10 comes as Ubiquinone or Ubiquinol. Ubiquinol is the active component, therefore the recommended dose is 300mg Ubiquinol or 600mg Ubiquinone daily.

### **Saizen**

Adequate growth hormone levels are critical for good ovarian follicular development and growth hormone levels are known to decline significantly with age. Saizen is an injectable growth hormone. Eggs naturally produce an analog of human growth hormone known scientifically as IGF-2. This factor promotes cell growth during the follicular phase of the menstrual cycle. Studies have demonstrated that growth hormone treatment during normal IVF treatment may restore youthful hormone production within follicles and improve the ability of the egg to repair damaged DNA. This is thought to help with egg maturation and quality, especially in women of advanced maternal age. Also, studies have shown far fewer miscarriages and higher take-home baby rates in women over the age of 40. Saizen is given by injection either for 5 consecutive days during the stimulation phase of the IVF cycle or possibly for 1 week prior to the start of menstruation.

### **Vitamin D**

Vitamin D, known as the sunshine vitamin, is vital for strong bones and a healthy immune system. In Canada, Vitamin D deficiency is a common problem and recent studies have suggested that women with sufficient levels of vitamin D are significantly more likely to achieve clinical pregnancy following IVF. The mechanism by which vitamin D affects fertility is unclear, however, it is an easy and cost effective measure that may improve pregnancy rates. Therefore, Vitamin D supplementation is recommended for all patients undergoing IVF.

### **Folic Acid**

Folic Acid (also known as folate or vitamin B9) is a vitamin which helps grow and protect cells in your body. In the beginning of pregnancy, even before the time most women find out they are pregnant, folic acid plays an important role in the early development of the part of the fetus called the neural tube. The neural tube grows into the brain and spinal cord. When the tube doesn't close properly, this is called a neural tube defect (NTD). Some examples of NTDs are spina bifida (the spine or its covering stick out of the back), anencephaly (absence of part of the brain), and encephalocele (part of the brain grows outside the skull). Daily folic acid supplementation, ideally started 3 months prior to pregnancy, can help prevent NTDs. Women with a previous pregnancy affected by NTDs should take 4mg folic acid daily.



### **Myoinositol**

Myoinositol is part of the B vitamin complex and is a known insulin stabilizer. It has been shown to improve both physical (hirsutism and acne) and reproductive (anovulation and amenorrhea) manifestations of Polycystic Ovarian Syndrome (PCOS). In addition, myoinositol plays a role in cell growth and early studies indicate that higher levels of myoinositol in the follicular fluid was associated with better egg quality. On another positive note, myoinositol has been shown to have a positive therapeutic effect on mood disorders that are responsive to SSRI's (serotonin selective reuptake inhibitors), therefore, possibly improving depressive symptoms and anxiety.

### **Melatonin**

Melatonin is a hormone that regulates our sleep/wake cycles as well as hormones of the female reproductive cycle. Data suggests that taking melatonin with myoinositol prior to IVF may help to improve egg quality. This benefit is seen with low dose supplementation of only 3 mg once daily before bed. Possible side effects include exacerbation of depression symptoms so patients who struggle with depression should discuss this side-effect with their physician. Melatonin can also impact thyroid hormone levels and in high doses can suppress ovulation so not exceeding 3mg daily is critical.

### **PQQ (Pyrroloquinoline Quinone)**

PQQ is a 'vitamin like' component found within enzymes of plants and bacteria. It has been found to stimulate cell growth and serves as an assistant to specific enzymes involved in cellular growth, development, differentiation and survival. It has been found to improve cell functions by stimulating growth, reducing oxidative stress as well as spontaneous generation of new mitochondria (the energy making component in cells) within aging cells. PQQ can actually create new mitochondrial. This means that cells that were either damaged or has aged and were inefficient in creating energy, can now grow new cell energy making components. This means that older aged eggs that may have been unable to grow and divide previously may now become fertile. PQQ and CoQ10 are being prescribed together as helpful supplements that can improve egg quality and reverse cellular aging. PQQ creates more mitochondria while CoQ10 helps the mitochondria convert energy more efficiently. Both supplements should be used for a minimum of 3 months. The dosage will be 20mg daily.



### **L-Taurine**

L-Taurine, also known as taurine, is considered an essential, non-essential amino sulfonic acid. It has been called a 'wonder molecule' that has very broad benefits for the body. It is a membrane stabilizer for our cells and has various anti-oxidant defense systems. Our bodies break up protein found in meats, fish, eggs and dairy and turn them into amino acids. As we age our bodies typically fail to produce optimal amounts of taurine causing a wide range of disorders, such as; diabetes, gall bladder issues, cardiovascular disease, brain disorders such as epilepsy and depression, retinal problems, increased cholesterol and liver disorders. Women will produce less taurine than men due to the production of, estrogen which can depress the formation of taurine in the liver. Women also on a vegetarian diet will produce very little taurine. Taurine has been found in the reproductive tract fluids in women and it is thought to play a role in preimplantation and healthy embryo development. Supplemental dosages between 500-2000mg have shown efficiency.