

<p><b>Introduction</b></p>	<p><b>Brand Name : Virlon</b> <b>Therapeutic Category – Nutraceutical [for Improvement of Motor Function of the Sperm]</b></p> <p>Medication, stress, addictions such as smoking, liquor consumption, fad diets, junk foods are all a part of the modern day society we have accepted as a part of our lives. However, these agents, have a great impact on the overall health of an individual, and an even greater impact on the sperm function. Reactive Oxygen Species [ROS] are generated both at exogenous and endogenous levels and can damage different parts of the spermatozoa including mitochondrial DNA (mtDNA) and thus impair sperm function. Spermatozoa are susceptible to oxidative damage caused by reactive oxygen species (ROS)</p> <p>It is well known that mitochondrial dysfunction is responsible for a variety of disorders. Oxidative stress occurs when the production of potentially destructive reactive oxygen species (ROS) exceeds the bodies own natural antioxidant defenses, resulting in cellular damage. Oxidative stress is a common pathology seen in approximately half of all infertile men. ROS, defined as including oxygen ions, free radicals and peroxides are generated by sperm and seminal leukocytes within semen and produce infertility by two key mechanisms. First, they damage the sperm membrane, decreasing sperm motility and its ability to fuse with the oocyte. Second, ROS can alter the sperm DNA, resulting in the passage of defective paternal DNA on to the conceptus.</p> <p>Unfortunately for those individuals, who have a sperm membrane damage along with mitochondrial damage, need a corrective treatment. Unlike other disorders, the only available treatment as of now is using nutraceutical substances, with minerals/micronutrients for protecting spermatozoa against membrane damage and mitochondrial damage. A combination of antioxidants, membrane protectors and substance that</p>
<p><b>Lycopene</b></p>	<p>Lycopene, a lipid soluble natural carotenoid pigment is synthesized by many plants and microorganisms to absorb light during photosynthesis and to protect them against photosensitization. However, it is not synthesized by animals and humans. Common dietary sources of lycopene include tomatoes, watermelon, pink guava, pink grapefruit, papaya, apricot and other fruits. Tomatoes and tomato-based foods account for more than 85% of all the dietary sources of lycopene. Nutritional supplements also contribute to the daily intake of lycopene.</p> <p>In general, lycopene absorption in humans from dietary sources is reported to be in the range of 10-30%<sup>18,19</sup>. Serum lycopene levels were significantly higher in subjects consuming tomato juice, tomato sauce and tomato oleoresin capsules compared to controls. Other studies have shown that lycopene is absorbed more efficiently from processed tomato products compared to raw tomatoes. The increased absorption of lycopene from processed tomato products is attributed to the presence of cis-isomers of lycopene. With an increase in the level of lycopene in the serum, significant reductions in the markers of oxidation including lipid, protein and DNA oxidation were observed indicating that once absorbed, lycopene maintains its antioxidant properties in vivo. Upon absorption, lycopene is distributed throughout the body. Testes, adrenal glands, prostate, breast and liver were shown to have the highest levels of lycopene in humans. Lycopene in the tissues undergoes oxidation and metabolism.</p> <p><b>Mechanism of Action:</b> Due to the highly unsaturated nature of the lycopene molecule, its antioxidant properties have been the main focus of research to study its antioxidant properties. may also provides its protective effect against chronic diseases via other mechanisms. These other mechanisms include gene function regulation, gap-junction communication, hormone and immune modulation, carcinogen metabolism metabolic pathways involving phase I and II drug-metabolizing enzymes and cell cycling pathways and proliferation. Another important human health disorder is infertility among males. Upto Another important human health disorder is infertility among males. Up to 10% of males are reported to suffer from this disorder. Infertile men have been shown to produce higher levels of the damaging ROS. Human sperm containing high levels of unsaturated fatty acids in the cellular membrane are at high risk for oxidative damage leading to sperm function abnormality.</p> <p>Another important human health disorder is infertility among males. Up to 10% of males are reported to suffer from this disorder. Infertile men have been shown to produce higher levels of the damaging ROS. Human sperm containing high levels of unsaturated fatty acids in the cellular membrane are at high risk for oxidative damage leading to sperm function abnormality. When infertile men were given 8 mg lycopene per day in the form of capsules, significant improvement in the quality of their seminal fluid was observed showing increased sperm density, functional sperm concentration and motility. After being on the lycopene treatment for 12 months a success rate of 36% in pregnancies of their partners was reported</p> <p>Based on the scientific evidence as available from published data, it is reasonable to conclude that lycopene is a beneficial phytonutrient with potent antioxidant properties that play an important role in the prevention of many chronic diseases. Although the antioxidant property of lycopene has been studied the most, other mechanisms by which lycopene prevents human diseases are now being studied and documented. Dietary intake data from around the globe reveals the fact that the intake of the majority of human subjects is far below what is now considered as a recommended level of 5-7 mg daily. Opportunity exists for health professionals and industry to narrow this gap and prevent deficiency leading to development of both and acute and chronic disorders.</p>
<p><b>Selenium</b></p>	<p>The essential trace mineral, selenium, is of fundamental importance to human health. As a constituent of selenoproteins, selenium has structural and enzymic roles, in the latter context being best-known as an antioxidant and catalyst for the production of active thyroid hormone. The best known of these are the antioxidant glutathione peroxidase enzymes, which remove hydrogen peroxide and damaging lipid and phospholipid hydroperoxides generated in vivo by free radicals and other oxygen derived species. Selenium is important for proper reproductive performance. Sperm capsule selenoprotein is a structural selenoprotein found in the mid-piece region of the sperm tail. In selenium deficiency, morphological anomalies in this region give rise to spermatozoa with impaired motility. Selenium is also needed for normal testosterone metabolism and testicular morphology, which may explain the presence of several other selenoproteins in the male gonads.</p> <p><b>Fertility and Reproduction</b></p> <p>In men, GPx4 [ glutathione peroxidase – GPx4 ] is found in the mitochondria that make up the midpiece sheath of the sperm tail. In the early phase of spermatogenesis, GPx4, as a peroxidase, protects spermatozoa by its antioxidant function, whereas in the later phase, it forms cross-links with mid-piece proteins to become a structural component of the mitochondrial sheath surrounding the flagellum, which is essential for sperm motility. Selenium treatment in the aging subjects could up-regulate the expression of CatSper genes, and therefore results in elevation of sperm motility. Furthermore, Se treatment improved sperm parameters, especially morphology and viability rates.</p>

**Chromium  
piccolinate**

Chromium has been known to be a micronutrient for mammals for four decades, but progress in elucidating the role of chromium has proceeded slowly. However, recent studies have shed light on a potential role of chromium in maintaining proper carbohydrate and lipid metabolism at a molecular level. Chromium from the popular dietary supplement chromium picolinate enters cells via a different mechanism. Release of chromium from chromium picolinate for use in cells requires reduction of the chromic center, a process that can lead potentially to the production of harmful hydroxyl radicals.

<b>Alpha Lipoic Acid</b>	<p>Alpha lipoic acid, a naturally occurring dithiol compound which plays an essential role in mitochondrial bioenergetic reactions, has gained considerable attention as an antioxidant for use in managing complications of chronic disease such as diabetes etc. It is synthesized enzymatically in plant and animal mitochondria from octanoic acid and cysteine (as a sulfur source).</p> <p>Lipoic acid quenches, reactive oxygen species [ROS], chelates metal ions, and reduces the oxidized forms of antioxidants such as Vitamin C, E and Glutathione. It also boosts antioxidant defence systems, through Nrf-2 mediated antioxidant gene expression and modulation of peroxisome proliferator activated receptors regulated genes. ALA inhibits, nuclear factor kappa B and activates AMPK in skeletal muscles, which in turn have a large number of metabolic consequences. In addition, to these effects, ALA also has the ability to chelate metal ions and prevents lipid peroxidation an important characteristic essential for the prevention of membrane damage to the spermatozoa, thereby preserving the membrane integrity. Studies have demonstrated that alpha-lipoic acid significantly improved sperm motility, the rapid forward progression and straight linear velocities, as well as the mitochondrial function of the sperm cell. Also, alpha-lipoic acid supplementation effectively limited reactive oxygen species (ROS) production, inhibited lipid peroxidation and prevented early sperm membrane damage. Recent findings have also indicated that ALA is able to enter the Krebs cycle, thus assisting in the production of ATP, which is required in viable spermatozoa.</p>
<b>Lutein</b>	<p>Lutein is a xanthophyll and one of 600 known naturally occurring carotenoids. Lutein is synthesized only by plants and like other xanthophylls is found in high quantities in green leafy vegetables such as spinach, kale etc. Lutein is obtained by animals directly or indirectly, from plants. Lutein was found to scavenge superoxide radicals, hydroxyl radicals and inhibited in vitro lipid peroxidation. Due to its powerful antioxidant activity, Lutein in combination with Lycopene exerts a very powerful antioxidant activity against ROS in preventing DNA damage to spermatozoa.</p>
<b>Summary of the Mechanism of Action of Virolon</b>	<p><b>Virolon improves the motor function of sperm by the following actions:</b></p> <ol style="list-style-type: none"> <li>1. Virolon up-regulates the expression of CatSper genes and improves power of penetration</li> <li>2. Virolon improves mitochondrial output, increasing the energy levels</li> <li>3. Virolon prevents lipid peroxidation and provides total antioxidant effect thereby scavenging the free radicals</li> <li>4. Virolon prevents genetic aberrations &amp; sperm abnormalities</li> <li>5. Virolon prevents breakage of DNA</li> </ol>
<b>Indications &amp; Dosage</b>	<p>The main indication for Virolon is the <b>“improvement of motor function of the sperm”</b> by preventing damage to the important components of the sperm such as membranes, mitochondria, DNA and improving acrosomal reaction for better penetration of the sperm and enhancing fertility.</p> <p>The suggested dosage is 1 vegetable capsule BID for a minimum 3 months. The capsules should be swallowed whole and taken along with a</p>
<b>Composition</b>	<p><b>Each Vegetarian Capsule Contains:</b></p> <p>Lycopene (10% ext.) - 6000 mcg          Chromium Picolinate - 200 mcg          Selenium - 100 mcg          Alpha Lipoic Acid - 50 mg and          Lutein - 0.5 mg</p>
<b>Storage</b>	<p>The capsules must be stored away from direct sunlight and kept in a cool dry place, out of reach from children</p>
<b>Presentation</b>	<p>Each strip contains 1x10 vegetable capsule and each box contains 10 strips</p>