Vitamins & Eye

In the United States, an estimated 80 millions Americans have potentially blinding eye diseases, & 1.1 million people are legally blind. Approximately 12 million people have some degree of visual impairment that cannot be corrected by glasses, & more than 100 millions people need corrective lenses to see properly. By 1995, the economic impact of visual disorders & disabilities was approximately $38.4 billion each year.
(Source: Courtesy of National Eye Institute, Optics Laboratory, and Inc 1998-2000)

Free radicals & Diminished Vision
As people age, they are often faced with diminished vision stemming from age related maculae degeneration. (ARMD) or cataract. ARMD the leading cause of blindness in people over the age of 55 affects an estimated one million Canadians. The prevalence of ARMD is expected to increase as the population ages. According to a recent poll, aging North Americans fear blindness more than any other disability.
Many scientists hypothesize that free radicals (Molecules with an unbalanced pair of electrons) generated by ultra-violet rays of sun and blue light play a role in the development of both ARMD and cataracts. Free radicals seem to cause oxidation and loss of pigments in the macula over time, and also oxidize lens proteins, which clump together and precipitate, causing parts of the lens to become opaque.

Anti-oxidants compounds such as Vitamin A, C and E, and trace elements such as Selenium, Zinc, Manganese and Copper appear to help cells fight off free radical damage. As people age, their bodies loss these natural defense mechanisms. While the results of major clinical trials will not be reported for several years, many vision care specialists are advising their patients to supplement their diets with antioxidants rich vitamins (A, D, E) and minerals (Zinc, Copper, manganese & Selenium) as a precaution.

Association between Nutrition & Cataract
Blindness due to opacities of the lens, or cataract afflicts over 50 million persons worldwide. In the USA over 541,000 cataracts extraction are done annually at a cost of over $3.8 billion. Conservative estimates indicate that the prevalence of cataracts in Americans aged 65-75 & 75-85 estimated that the need for cataract extraction would be diminished by half if onset of cataract could be delayed by only ten years. Hypothesis regarding the etiology of cataract include oxidative perturbations of proteins metabolism, diverse pathologic conditions, & perhaps glycation of lens proteins. Biochemical evidence suggest that compounds like, carotenoids (vitamin A), ascorbate (vitamin C) etc can delay photooxidative damage to lens proteins. Role in lens metabolism for selenium have been suggested. Elucidation of mechanism by which caloric restriction delays cataract development is a promising area of current research.
(Taylor A. Nutr Rev 1989;47:225-234)

Antioxidants in Cataract Prevention

The ocular lens, which is continually exposed to the light and ambient oxygen, is at high risk of the photo oxidative damage resulting in the cataracts. Oxygen free radicals appear to improve not only lens crystalline, which will aggregate, & precipitate forming opacities but also proteolytic enzymes whose function it would be to eliminate the damaged proteins. The lens contains vitamins C, E and presumably beta-carotene as another line of defense. The studies in different animal species have demonstrated a significant protective effect of vitamins C &E against light-induced cataracts. Sugar and steroid cataracts were prevented as well.
Epidemiological evidence in humans suggest that persons with comparatively higher intakes are at a reduce risk of cataract development.

These positive findings establish by several research groups justify extensive intervention trials with antioxidant vitamins in humans using pre-senile cataract development.
(Gerster H. Z Ernahrungswiss 1989;28:56-75)

Scientific basis for Medical therapy of Cataracts by Antioxidants
Cataract is one of the major cause of age-dependent visual impairments of blindness. The geographical distribution of cataract is known to be associated with the intensity and duration of sunlight-especially of the ultra-violet frequency at particular places. Exposure of humans and animals to oxygen has also been known to result in cataract formation. Studies described in this communication indicate that the ocular lens is physiologically damaged when exposed to an environment of active species of oxygen, commonly referred to as oxyradicals. Several photo chemical and nonphotochemical models have been described. The result suggests that intra ocular generation of active oxygen may constitute as significant risk factor in the over all pathogenesis of senile cataracts. The catratogenic effects of oxyradicals, however, can be disillusioned by nutritional and metabolic antioxidants such as ascorbate and Vitamin E. These agents, therefore, may be useful for the prophylaxis or therapy against cataracts.
(Varma SD. Am J Clin Nutr 1991;53:335S-345S)

Bottom Line
It may be next to impossible these days to obtain adequate amount of minerals from diet alone. Since delicate nutrients have been destroyed by food processing. The entire Canadian population may there fore benefit from taking supplements containing "Ocular Vitamins for the prevention of age related macular degeneration".
(Barbara G. Ogle, consultant Pharmacist and Community practitioner in Vancouver BC)