



## A Note on Cataract Surgery

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### Description

The term cataract refers to an opacity of various degree of the crystalline lens, which is normally almost completely transparent. There are a variety of methods to classify cataracts clinically, but pathological examination of cataracts may be difficult. With age, the height of the epithelial cells decreases and the width increases. Some studies have shown that a decrease in the number of epithelial cells occurs with cataract formation; other studies have been unable to find decreased number of cells. No anatomic features of the epithelium exist that influence surgical technique, but all ophthalmic surgeons recognize that the epithelium is exquisitely sensitive to trauma; its key metabolic role makes it the "Achilles 'heel" of the lens. In addition to the accelerated proliferation of lens epithelial cells in response to pacarine, autocrine, and mechanical factors, these same cells may undergo apoptosis in response to oxidative stress and TGF-beta 2. Oxidative stress is a well-known risk factor for age related cataract, and it is a growth factor associated with the cellular changes underlying PCO.

An interesting difference exists in the relationships among the capsule, the anterior epithelial cells, and the posterior lens fibres. The posterior fibres peel off easily from the capsule during stripping and aspiration, possibly because a potential space exists between the posterior fibers and posterior capsule. The anterior epithelial cells remain adherent to the anterior and equatorial capsule during stripping, perhaps because the capsule is part of the cell itself and not just a structure adjacent to it. The transparency of the normal lens is derived from its regular fiber arrangement and the minimal spatial variation in the index of refraction relative to the wavelength of incident light. In the cataractous lens, more abrupt changes occur in the index of refraction because of the accumulation of fluid with a low index of refraction between fiber cells in cortical and sub capsular cataracts, the formation of very high molecular weight cytoplasmic pro-

tein aggregates in nuclear cataracts. None of the individual crystalline proteins in the clear lens is large enough to scatter light. The aggregation of millions of light scattering foci in the lens constitutes a cataract. These aggregates may exist free in the cytoplasm or may be bound to cell membranes. Many surgeons have expressed their conviction that surgery is the only appropriate treatment of cataract related visual loss or blindness. In many parts of the world, however, there are too few surgeons and too many patients with visually disabling cataract. In these situations, the ability to address the age related cataract problem with a nutritional, medical, or environmental approach would greatly reduce suffering and the need for medical and surgical care. Viewing cataract related blindness from a world wide perspective places the non-surgical management of cataract in the proper context. Oxidative stress denotes the adverse effects of oxygen and its various redox forms of the constituents of the lens. Oxygen can exist as hydrogen peroxide, single oxygen, hydroxyl radical, and superoxide. There are enzyme systems in the lens that produce and destroy these redox species. The relative balance between systems that produce and systems that destroy these oxidants determines whether or not the lens suffers oxidative damage. The reason for your focal point is to twist (refract) light beams that come into the eye to help you see. Your own focal point ought to be clear, yet with a cataract it is shady. Having a cataract can resemble glancing through a hazy or dusty vehicle windshield. Things might look foggy, murky or less brilliant.

The best way to eliminate a cataract is with a medical procedure. Your ophthalmologist will suggest eliminating a cataract when it holds you back from doing things you need or need to do. During cataract medical procedure, your shady normal focal point is taken out and supplanted with a reasonable counterfeit focal point. That focal point is called an Intra Ocular Lens (IOL).