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Femtosecond laser is a near-infrared laser which works with a wavelength of 1053 nm.

The IntraLase Pulsion femtosecond laser was approved for use by the U.S. Food and Drug Administration for lamellar corneal surgery in January 2000 and the first commercial femtosecond laser was introduced to the market in 2001 for use in producing laser in situ keratomileusis.

The femtosecond laser achieves its surgical effect through a process termed photodisruption**.**

Currently commercially available platforms are the IntraLase FS , Femto LDV, Femtec and VisuMax. These generations generate FS laser pulses at a repetition rate ranging from 10 to 200 KHz

The femtosecond laser may have advantages over the microkeratome in the flap-making procedure for laser in situ keratomileusis, for anterior lamellar keratoplasty, penetrating keratoplasty, deep lamellar endothelial keratoplasty and Descemet stripping with automated endothelial keratoplasty surgery; tunnels for intracorneal ring insertion and in arcuate astigmatic keratotomy incisions.

The major advantages of femtosecond laser flap creation over the mechanical microkeratome are reduced incidence of flap complications, greater surgeon choice of flap diameter and thickness, increased precision with improved flap safety and absence of moving parts

Femtosecond lenticule extraction seems to be a gentle,safe and promising new corneal refractive procedure to correct myopia ,in which FS

laser is used to remove a disc of corneal tissue to reshape the cornea as a potential alternative to excimer laser-based LASIK.

Other uses of femtosecond laser in ophthalmology including glaucoma, cataract, presbyopia, branch retinal vein occlusion and in diagnostic corneal biopsy in keratitis corneal tattooing, keratoprothesis implantation and in PDT mediated by indocyanine green.

Femtosecond lasers have proven their value in refractive surgery, and the use of this technology for cataract surgery is now under development. Femtosecond laser-assisted cataract surgery may bring a new level of accuracy, consistency, and safety to several critical areas of cataract surgery, including the formation of the capsulorhexis and corneal incision (both the cataract incision and astigmatic keratotomies) and conditioning of the lens prior to its extraction.

For safe ocular femtosecond laser surgery, a compromise between procedure time, pulse energy and numerical apertures of objectives has to be found

Complications of femtosecond laser in ophthalmic surgery are little and mostly rare it include possible retinal damage and macular hemorrhage diffuse lamellar keratitis, central toxic keratopathy, flap slippage, epithelial defects, transient light sensitivity ,anterior chamber bubbles, opaque bubble layer, suction loss,epithelial gas brealthrough ,flap tear ,flap striae ,free flap and epithelial ingrowth