

TITLE: Corneal Collagen Cross-linking in the Military: A Game Changer

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One of the reasons why one gets denied refractive surgery such as LASIK, PRK or SMILE is keratoconus (KCN). It is an eye condition wherein the front part of the eye (cornea) gradually thins out and bulges causing irregularity in the shape of the eye resulting to blurry vision. It has been reported to occur in about 1 to 2 persons for every 1000 in the population. It typically happens in young adults who are in the late teens or twenties. Eye rubbing, sleep apnea, asthma, allergy, eczema, vernal conjunctivitis, floppy eyelid syndrome, connective tissue disorders, and a family history of KCN have been linked to the development of this condition. Historically, the main treatment for KCN was contact lenses when eyeglasses were not sufficient to correct the blurry vision until the condition further progresses and corneal transplantation is needed.

Because of its progressive nature, KCN has been a disqualifying condition in the military. Navy CAPT (Dr.) John Cason, prior Ophthalmology Specialty Leader and Refractive Surgery Advisor, stated that as an advisor, he reviewed about 2 to 5 sailor applicants per month for possible waiver for accession into the military due to KCN.

In April 2016, the Food and Drug Administration (FDA) approved corneal collagen cross-linking (CXL), the first and only treatment to date that is proven to stop KCN progression. Air Force Col (Dr.) Matthew Caldwell, Ophthalmology Consultant to the Surgeon General, called CXL a “readiness game changer.” He pointed that “KCN is of special interest to the military as the age range of impact nearly exactly overlaps years of active duty service.” The onset can happen before or after accession when screening is too late. “KCN impacts the ability to deploy and can degrade vision excluding careers in aviation, special forces, and in severe cases, even less visually intensive administrative work,” added Col Caldwell.

Since its FDA approval, hundreds of service members have been treated with CXL across the Department of Defense. Majority of these have been able to retain their military careers. In an unpublished retrospective analysis at WHASC, the largest Air Force eye center, 37 out of 49 service members who had CXL treatment were able to remain on active duty after showing stability of their KCN after CXL procedure.

Air Force Col (Dr.) Joseph Giovanni, Cornea Specialist at Travis Air Force Base (AFB) asserts, “I have seen several military careers saved by the procedure.” Air Force Capt Lowell DePalma, an aviator who had bilateral CXL himself, said, “CXL has allowed me to keep my job and helped my future eye exams to be more predictable.”

On the aspect of military accession, CXL has also offered benefits. Currently, ophthalmology consultants are able to recommend accession waivers for military candidates with early KCN as long as they are able to show stability after CXL procedure. As CAPT Cason stated, “CXL has offered the possibility of military service for a group of candidates with mild symptoms from KCN. In the past, these volunteers didn’t have the option of service due to restrictive guidelines that did not offer any flexibility with

treatment. CXL has given these people the possibility of treatment, stability, and a future military service that were previously denied.”

In the future, CXL may also significantly expand the options of vision-enhancing refractive surgery. Historically, service members with abnormal topographies were simply disqualified from refractive surgery. However, over the past decade, published clinical outcomes of CXL plus refractive surgery performed around the world have been favorable. As evidence on the safety and efficacy of CXL combined with refractive surgery grows, its forthcoming potential to reduce contact lens or spectacle dependence for otherwise poor refractive surgery candidates is conceivable.

As Air Force Lt Col (Dr.) James Townley, Refractive Surgery Consultant to the Surgeon General, summarizes, “The advent of CXL has helped tremendously to retain highly trained individuals and increase the applicant pool for the armed services.” With future technological advancement, CXL will likely continue to expand, not only the military’s capability to preserve, but also enhance vital human assets.

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