

12.15 CORNEAL REFRACTIVE SURGERY (PRK/LASEK/LASIK/SMILE)

Last Revised: MAY 17

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Refractive surgery (PRK/LASIK/SmILE) without visually significant side effects is **not considered disqualifying (NCD) for applicants or designated members that are within the refractive parameters outlined in this chapter**. Patients whose pre-operative refractions fall outside these parameters are considered disqualified (CD), but may be considered for a waiver on a case-by-case basis, depending on aviation class / military duty status.

	Applicant	Designated Class I ³ , II, III, IV
NCD	Refractive Limits (SNA): ¹ +3.00 to -8.00 SE Cylinder: ≤ 3.00D Refractive Limits (Class II, III, IV): +6.00 to -8.00 SE Cylinder: ≤ 6.00D ² Pre-op anisometropia: ≤ 3.50D.	Refractive Limits (LASIK/SmILE): -11.50 to +6.00 SE Cylinder: ≤ 6.00D Refractive Limits (PRK): No Limit (must be performed at a DoD Refractive Surgery Center)
CD	Parameters exceeding these values are CD	
WR (Considered on a case-by-case basis)	Waiver requirements for Applicants <ul style="list-style-type: none"> • At least 6 months since last refractive/augmenting procedure • No ongoing active ophthalmologic treatment or need for ophthalmic medications (other than in notes). • Post-surgical refraction stable as demonstrated by two separate refractions ≥ 1 month apart differing by ≤ +/-0.50 D (sphere) and ≤ +/-0.25 D (cylinder). • Post-operative manifest refractive errors within applicant stds. Class II, III and IV Applicants are considered for waiver on a case-by-case basis for: <ul style="list-style-type: none"> • Pre-operative refractions outside these refractive limits • Implantable collamer lenses (ICL) SNA Applicants are typically not eligible for waivers.	Class I <ul style="list-style-type: none"> • Procedures performed outside these refractive parameters Class II, III and IV: <ul style="list-style-type: none"> • Procedures performed outside these refractive parameters • Implantable Collamer Lenses (ICL)
WNR	SNA Applicants: <ul style="list-style-type: none"> • Procedures performed outside these refractive parameters • ICLs not permissible or waivable 	Class I <ul style="list-style-type: none"> • Implantable Collamer Lenses (ICL)
LBFS	Not required – CRS within parameters is NCD and FS may provide upchits concurrent with initial AMS submission	
LIMDU/PEB	Corneal Refractive Surgery is an elective surgery. Without complications, these surgeries will not be grounds for LIMDU or a PEB	

Notes

¹ SNA applicants must have a post-operative cycloplegic refraction using 1% cyclopentolate performed at a military installation. The cycloplegic refraction is to assure $\leq +3.00$ D **sphere** only. **Cycloplegic cylinder (astigmatism) values are not considered, nor is a cycloplegic visual acuity required.**

² Per MANMED: Programs leading to a commission typically must still adhere to the 3.00 D cylinder limit.

³ For the purposes of qualification for Class I Designated aviators, SG-1, SG-2 and SG-3 have the same requirements WRT CRS. Differing visual acuity and refractive limits still apply.

*** For designated personnel previously enrolled in the LASIK IN DESIGNATED AVIATORS ***
 *** STUDY and the LASIK IN STUDENT NAVAL AVIATORS STUDY, submission of waiver ***
 *** renewals is no longer required as the studies are closed. Aviation personnel who ***
 *** currently have waiver requirements may petition NAMI Code 53HN to have their waiver ***
 *** removed, if they fall within the NCD refractive parameters outlined in this chapter. ***

There must be no symptoms or conditions that would be cause for concern during flight duties, including, but not limited to: post-operative discomfort requiring ongoing care, moderate or severe dry eye requiring the use of artificial tear drops more than 4 times per day or punctal plugs, recurrent corneal erosions, or visually significant glare, haloes, or starbursts. Ongoing post-surgical complications requiring other prescription medications are considered disqualifying.

*** Topical artificial tears (≤ 4 times per day), cyclosporine drops, or lifitegrast drops for mild ***
 *** dry eye are not disqualifying for return to flight consideration. ***

Refractive stability and a satisfactory postoperative slit lamp exam are required. Glare testing with a transilluminator or a Brightness Acuity Tester (BAT) is required for any corneal haze to determine if the level of haze is visually significant or not. Members must meet their aviation class vision standards with glare/BAT testing. Trace, stable, peripheral haze that is not visually significant is NCD and does not require a waiver submission.

** MANMED limits of ± 8.00 diopters of refractive error do not apply in aviation personnel as the refractive parameters defined here for aviation personnel are more restrictive.

The [CRS AMS worksheet](#) is required to be submitted in AERO to NAMI Code 53HN for ALL refractive surgery procedures (both NCD and CD) once stability and required wait times to resume flight duties have been met. Include pre-operative eye exams and laser treatment reports. Re-treatment procedures shall be treated like initial surgery, and all requirements of initial surgery shall be followed.

Post-operatively, the member must pass all MANMED vision standards for their class or applicant status. They must wear corrective lenses while flying if required to achieve the vision standard. Any procedures that fall outside of the refractive limits defined in MANMED 15-34(3)(b)(2-5), or that do not meet requirements defined in this chapter shall be considered disqualifying and submitted to NAMI for review and waiver consideration.

Active duty aviation students (SNA, SNFO, etc.) must obtain specific authorization from their training command prior to any CRS. Students who undergo refractive surgery shall adhere to the same refractive parameters and timelines for resuming flight duties as their designated counterparts to return to training status as soon as practicable. Active duty aviation students authorized for CRS must undergo refractive surgery at a military refractive surgery center.

Authorized Refractive Surgery Centers for DESIGNATED flyers

Class I: Any DON Refractive Surgery Center as well as the Refractive Surgery Centers at Tripler AMC, Keesler AFB, Brooke AMC and Ft. Belvoir

Class II/III/IV: Any DoD Refractive Surgery Center

**Notes
(continued)**

Civilian applicants must meet all applicant corneal refractive surgery (CRS) parameters, and obtain PRK, LASIK/SmILE or ICL surgery at their own expense at a civilian refractive surgery center. DoD policy requires a six month minimum wait time prior to being eligible for accession. NAMI requires a military eye examination.

Other forms of refractive surgery, or any vision or corneal manipulation or surgery, including **RK** (radial keratotomy), **LTK** (laser thermal keratoplasty), and **ICR** (intracorneal ring), unless specifically included in this chapter are **permanently disqualifying (CD/WNR)** for all aviation duty Class I, II, III and IV personnel.

Clear/Refractive Lens Extraction (RLE) will be considered by NAMI on a case-by-case basis for designated members; applicant waivers are typically not recommended for RLE. Please contact the NAMI Eye Dept for guidance prior to RLE for any winged aviation personnel. Section [12.1 \(Cataract\)](#) has further information on approved intraocular lenses.

Ongoing orthokeratology is permanently disqualifying. Orthokeratology (“Ortho-K”, rigid contact lens corneal reshaping) is not considered disqualifying provided that it is *permanently discontinued* at least three months prior to applications, with all refractive standards met with stable topography.

ICD-10 CODES:

Z98.89 Other specified postprocedural states

*CPT Codes:

PRK: S0810

S0800 for LASIK

08Q8XZZ Repair Right Cornea, External Approach (PRK or LASIK)

08Q9XZZ Repair Left Cornea, External Approach (PRK or LASIK)

DEFINITIONS:

- **Corneal Refractive Surgery (CRS):** A laser is used to reshape the anterior corneal surface reducing refractive error and reliance on spectacles or contact lenses. A “wavefront-guided” (WFG) or “custom” procedure uses wavefront analysis technology, and may improve the visual outcome of the procedure.
- **Photorefractive Keratectomy (PRK) or Laser-Assisted Sub-Epithelial Keratectomy (LASEK):** Laser energy is applied to the anterior corneal surface after the epithelium is temporarily displaced or removed. No stromal corneal flap is created in PRK. PRK variants include LASEK (epithelium is preserved), and Epi-LASIK (epithelial flap is created). Pain can be moderate to severe, and visual recovery can take months, but does not have the risk of flap complications, with similar visual outcomes at 6 months. LASEK and Epi-LASIK are considered PRK with regard to CRS policy and aviation qualification.
- **Laser-Assisted In Situ Keratomileusis (LASIK):** A cornea stromal flap is created with an infrared laser (“intralase”), or older technology, a metal blade keratome, after which a different excimer laser is used to reshape the exposed corneal stroma to correct refractive error. The corneal flap is then repositioned. Pain is minimal and vision recovery is much faster than PRK (2 to 4 weeks). Flap complications are rare, with no risk of haze formation, like PRK. Due to decreased aeromedical complications seen historically, “all-laser custom LASIK” is preferred, as determined by the operating surgeon and patient.

- **Refractive Lenticule Extraction or Small Incision Lenticule Extraction (ReLEx or SmILE):** A similar femtosecond laser technology used for LASIK flap creation is used to create a small intrastromal lenticule of tissue, which is removed to correct the vision. It is considered a variant of LASIK, with a much smaller, stronger, and more stable corneal incision. ReLEx/SmILE has excellent safety, efficacy, long-term stability, and often improves low contrast vision. ReLEx/SmILE is considered LASIK with regard to CRS policy and aviation qualification parameters.
- **ICL (implantable collamer lens) or pIOL (phakic intraocular lens):** During ICL surgery, a small corneal incision is made to insert an artificial lens just behind the iris, in front of the natural crystalline lens. Since no corneal tissue is removed, ICLs are often used in cases of very high refractive error and/or when the cornea is too thin to manipulate surgically with a laser for vision correction. ICLs provide fast and stable visual recovery and high quality vision. Along with other possible, but uncommon side effects, cataract development post-operatively is a rare possibility. ICLs are considered disqualifying in all classes of aviation personnel, but waivers may be considered for applicants and designated members of Classes II, III, and IV. For Class I applicants and designated Class I aviators, waivers will typically not be considered. ICLs are NCD for ground crew/maintainers.

DISCUSSION:

- The goal of corneal refractive surgery is to reduce or eliminate dependence on spectacles or contact lenses, which can be distracting and reduce performance of flight duties. Refractive surgery (LASIK/PRK) has been studied extensively in the aviation environment and has yielded highly satisfying results for vision, comfort, and performance. More than 95% of Naval Aviators reported “increased effectiveness” after undergoing refractive surgery.
- When seeking corneal refractive surgery it is incumbent upon the member and the member’s commanding officer and flight surgeon to be aware of the requirements defined in this guide, and in the Manual of the Medical Department, and to be willing to adhere to the timelines and parameters specified before being allowed to resume flight duties.
- For unusual circumstances or concerns, the NAMI Eye Department remains available for consultation through phone or email: 850-452-2933 or usn.pensacola.navmedotcnamefl.list.nami-ophthal@mail.mil

AEROMEDICAL CONCERNS:

- Corneal refractive surgery (CRS) has been evaluated by the Naval Refractive Surgery Center and yielded excellent visual results, with increased performance of aviation duties. Custom wavefront-guided treatments yield even better visual outcomes, and are preferred if possible.
- As with any surgical procedure, there are inherent risks, such as quality of vision deficits (e.g. halos and glare at night), haze, flap complications and persistent eye discomfort (e.g. dry eye or recurrent erosions). A detailed description of the rate of complications, risks, benefits, and alternatives should be discussed and consented between the patient and their refractive surgeon.
- Undergoing refractive surgery does not guarantee qualification for aviation. The member must meet pre-operative parameters in MANMED and this waiver policy guide. Post-operatively, the applicant must meet all vision standards appropriate to their aviation class.

CRS GENERAL GUIDELINES (applicants and designated personnel):

- Designated members who undergo refractive surgery shall be grounded at the time of surgery, but a grounding physical is not required (if not down for more than 60 days).

- Subsequent CRS re-treatments, even if considered a “touch-up,” shall be considered as a new initial surgical procedure in terms of meeting aviation class vision standards and requiring submission of the [CRS AMS template](#) in AERO. Minimum time requirements must be met to resume flight duties depending on the procedure and treated refractive error. Applicant re-treatments shall have cumulative laser values summed for determining maximum refractive parameters for considering disqualification.
- Designated members who meet NCD refractive limits and undergo successful refractive surgery without ongoing complications or significant symptoms may be returned to flight duty once cleared by a military eye care provider, and meet the timelines in the table below:

Minimum time to return to flight for designated aviation personnel	<u>LASIK, SmILE or variants</u>	<u>PRK or variants</u>
	Hyperopia \leq +4.00 SE: 4 weeks Hyperopia $>$ +4.00 SE: 8 weeks	Hyperopia: 6 months
		Myopia \leq -6.00 SE: 3 months
Myopia: 2 weeks	Myopia $>$ -6.00 SE: 6 months	

NOTE: Active duty applicants with normal and stable post-operative corneal refractive surgery who are applying for aviation programs (i.e. STA-21, UAV operator, NFO/SNFO to SNA transition, etc.), may be considered for accession into their chosen program at 3 months for operational and training requirements (vice the typical 6 month requirement). All pre-operative exams and operative reports, as detailed above, must be submitted to the NAMI Physical Standards Directorate (Code 53HN) as part of the initial flight physical.

- The preferred technique for CRS in aviation personnel is the All-laser wavefront-guided LASIK (“custom intralase LASIK) or SmILE, as custom treatment may increase visual acuity and ultimate vision outcome, while minimizing the risk of significant haze complications occasionally seen after PRK. LASIK/SmILE also has much reduced down time, which has a great advantage in returning the member to operational flying duties.
- LASIK/SmILE is not a requirement for flight, as not all members are candidates for these procedures after being screened by the surgeon; PRK may be the better option for certain cases. The final decision of performing PRK vice LASIK/SmILE is made by the ophthalmologist with the patient’s informed consent.
- Operational Training: Ongoing military requirements such as tear gas (CS), pepper spray, water survival training, dusty/dirty environments, etc., may have a deleterious effect upon post-surgical eyes. Recommended wait-times after surgery are outlined in the table at the end of this chapter for members with a normal post-operative course and cleared by their eye care provider.
- Deployment after CRS: Members may not deploy for at least three months after PRK and one month after LASIK surgery (per NAVMED POLICY 08-008, dtd 10 JUN 2008).

Recommended Wait Times for Activities after Refractive Surgery

-LASIK (Laser-Assisted In Situ Keratomileusis): The greatest risk after LASIK is flap dislocation. Avoid activities that might cause trauma to the flap.

-PRK (PhotoRefractive Keratectomy): The greatest risk after PRK is corneal surface irritation and haze. During the first 3-4 months after surgery, avoid activities that might irritate the surface of your eyes, and avoid exposure to ultraviolet (UV) light by wearing sunglasses (with UVA/UVB protection) when outdoors during the day.

-ICL (Implantable Collamer Lens): The greatest risk after ICL is infection inside the eye. Avoid lifting or bending over, trauma to the eye, and avoid activities that increase infection risk such as swimming and gardening.

	ICL	LASIK/SmILE	PRK
Showering or washing face.	No restriction. Notes: You should always avoid getting water in the eyes and pat the eyes dry; do not rub the eyelids dry.		
Air travel as a passenger	3 days		5-7 days (after removal of bandage contact lens)
Aerobic activity (walk, run, bike, exercise machines) or weight training. Notes: Avoid getting sweat, dust, or wind in eyes.	2 weeks	As soon as pain and light sensitivity have resolved: 1-2 days.	As soon as pain and light sensitivity have resolved: 3-5 days.
Bending over--toe touches, sit-ups	2 weeks	No restriction.	
Contact sports: Martial arts, basketball, boxing, wrestling	1 month. Note: CRS increases lifetime risk of opening surgical wounds with trauma to the eye. Wear eye protection.		1 month.
Exposure to hot tubs, pools, lakes, ocean, river	1 month Note: Risk of infection from contaminated water		
Wearing eye make-up, including camouflage face paint	2 weeks Note: Infection risk from contaminated make-up. When make-up use is resumed, start with new, freshly opened products. Old eye makeup should be discarded.		
Working in a dusty or dirty environment: outdoor rifle range, deploying to the field, gardening	1 month	2 weeks	1 month
CS exposure (gas chamber) or OC spray (pepper spray) exposure	3 months		6 months
Driving an automobile motorcycle with goggles or face shield	When you meet the driving vision requirement and feel comfortable.		
Wearing UV protection (sunglasses)	Wear UV protection whenever practical.		Full time first month As much as possible the 2 nd -4 th months and whenever practical afterwards.

Ask your doctor if you have questions about these or other activities.

12.16 NAVAL AVIATION CONTACT LENS POLICY

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All classes of Naval aviation personnel shall be allowed to wear contact lenses during duty involving flight when the following requirements have been met as outlined below, and allowed by local commander's policy in theater. A notation from the flight surgeon authorizing contact lens use is required on the aeromedical clearance notice (up-chit) DD2992. Contact lens use is not considered disqualifying (NCD). A waiver for their use is not required. Note: funding is typically not available for student aviators.

REQUIREMENTS:

1. Visual requirements specific to each class and service group must continue to be met while wearing contact lenses.
2. Near visual acuity must be 20/20 in each eye. Presbyopic personnel may use spectacles over their contacts to achieve this standard.
3. There must be no symptoms incompatible with safe flight, e.g. fluctuating vision, reduction in vision at night or under glare conditions, or discomfort.
4. Must have worn contact lenses on a daily basis without complication for a minimum of two weeks before their use can be authorized on the "up-chit."
5. The prescribing eye doctor must note in the patient's record that a good fit has been achieved and that no further changes are planned.
6. Soft contact lenses (SCLs) are not to be worn overnight while in flight training or flight status unless operationally mandated. If extended contact lens wear (greater than 24 hours) is an operational requirement, lenses may be worn for a maximum of seven consecutive days. Personnel are encouraged to limit extended wear to the shortest period possible. A minimum 12 hour recovery period, during which no contact lenses are worn, shall follow each extended wear period. Rigid gas permeable lenses shall not be used overnight.
7. During aviation duties, it is the responsibility of all contact lens wearers to carry clear spectacles in a readily accessible protective case, which correct the wearer's vision to all applicable standards.
8. Follow-up examinations for personnel wearing contact lenses shall be conducted at least annually by a military optometrist or ophthalmologist.

APPROVED CONTACT LENSES:

1. Only nationally available, FDA approved lenses and solutions are allowed.
2. FDA approved silicone hydrogel contact lenses are the most commonly prescribed soft contact lenses (SCL) for Naval aviation personnel. Rigid gas permeable lenses are permissible, but strongly discouraged. Note: Dailies (discarded after one day of wear) are okay for flight; however, they will typically not be purchased and supplied by the MTF Optometry clinic due to their higher cost.
3. The following are NOT authorized:
 - a. Bifocal/multifocal contact lenses.
 - b. Cosmetically tinted contact lenses.
 - c. Sports tinted contact lenses (e.g. amber or green).
 - d. Contact lens wear for corneal refractive therapy (Ortho-K).
4. The following are only authorized with an appropriate waiver:
 - a. Combinations of rigid and soft contact lenses.
 - b. Contact lens use for therapeutic reasons such as keratoconus or basement membrane dystrophies.

For any other questions regarding specific brands of contact lenses or waiver issues, please contact:
Phone: NAMI Eye Department at 850-452-2933
Email: usn.pensacola.navmedotcnaefl.list.nami-ophthal@mail.mil