

Descemet's Stripping Endothelial Keratoplasty (DSEK)

Your doctor thinks you will benefit from a corneal transplant. This handout will explain your options. It explains the difference between a standard corneal transplant and Descemet's Stripping Endothelial Keratoplasty (DSEK).

Corneal Transplant Surgery

The human cornea is made up of three layers.

- Outer – epithelial layer
- Middle – stromal layer (about 90% of the total thickness)
- Inner – endothelial layer

The endothelial layer is made up of a single layer of thousands of small pump cells. These cells sit on a thin strip of tissue called Descemet's membrane. These pump cells pump fluid out of the cornea so it can remain clear and thin to provide good vision for the eye. If the pump cells stop working, the cornea fills up with fluid. It becomes swollen, cloudy, and causes blurry vision.

Causes include:

- Aging
- Inherited diseases (such as Fuchs' Corneal Dystrophy)
- Trauma
- Prior eye surgery

If a critical number of endothelial cells are lost, the cornea becomes swollen and cloudy. Medical treatment is not helpful. You will need a corneal transplant. The other corneal layers, the stroma and outer epithelium, are most often healthy. Many patients needing corneal transplant have problems only with the endothelial cells.

Pros and Cons of Regular Technique

A standard corneal transplant consists of removing the entire cloudy cornea. It is replaced with a full thickness donor cornea which replaces all three layers of the cornea.

The standard corneal transplant has a 90% success rate. The rate of rejection is only about 8%. It is easy to combine cataract extraction or glaucoma surgery.

The drawbacks of the standard corneal transplant:

- Length of time for the surgery (90 to 120 minutes).
- Problems in suturing the new cornea into place.
- Sutures may come loose or cause infections.
- Sutures may cause astigmatism (an irregular corneal shape). It can be so major that eyeglasses

alone won't correct it. Some patients may need contact lenses or more surgery.

- Risk of a rupture or break from mild or minor trauma, even years after the surgery.
- It may take 12 to 18 months to heal.

Pros and Cons of DSEK Technique

For many patients only the diseased or missing endothelial cells need to be replaced. The other layers may be normal. We now have a technique called DSEK. It replaces only the endothelial cell layer. A thin button of donor tissue with only the endothelial cell layer is inserted onto the back surface of the patient's cornea.

There are many reasons to choose DSEK.

- DSEK is faster (60 to 90 minutes).
- The wound is smaller and closer in size and location to a cataract surgery incision.
- The smaller wound is more stable and less likely to break open from trauma.
- Because the wound is smaller and requires fewer sutures, there is very little risk of astigmatism.
- Healing takes only about 3 to 4 months.
- Since only the thin inner layer of the cornea is replaced, over 90% of the patient's own

cornea remains behind. This lowers the chance of rejection.

DSEK is not for everyone. Some patients with corneal scarring or other conditions may not be able to have DSEK.

There is a 10% risk of the graft moving within the first few days or weeks after surgery. This means the graft must be redone and replaced with an air bubble in the eye. If DSEK fails, the surgery can be repeated. If the DSEK fails, a standard corneal transplant can be done.

The DSEK Surgery

1. Donor corneal tissue is obtained from an Eye Bank for the day of your surgery.
2. In your pre-op room, you will get eye drops and an IV line will be placed in your hand.
3. While you are briefly asleep, the eye is numbed.
4. A 5mm incision is made at the edge of the cornea. If you are having cataract surgery, the cataract is removed using a standard technique.
5. Your cornea is marked on the outside to guide removal of the diseased Descemet's membrane and endothelium.
6. The Descemet's membrane is stripped and removed from your eye.

7. The new donor cornea is cut to match the size of the membrane removed from the eye.
8. The donor tissue is folded gently and placed into your eye.
9. The graft is then unfolded and secured in the correct place on the cornea using an air bubble that is injected into the eye.
10. As the air bubble seals the newly transplanted tissue in place, you will receive dilating eye drops.
11. Some of the air is removed from the eye to make the eye pressure normal.
12. The incision sites are tested and closed with 2 to 3 small sutures.
13. You will be moved to the recovery room.

In the recovery room, you will lie on your back for 1 hour so that the air bubble can maintain pressure against the back of the cornea, so the new tissue stays in place. You are also asked to remain flat on your back as much as you can at home for the first 24 hours. Your eye will be patched shut overnight. You are seen in the eye clinic the next day.

Risks of DSEK Surgery

- Bleeding in the eye
- Infection
- Swelling of the retina causing short-term or permanent blurring of vision
- A retinal detachment

- Glaucoma or high pressure in the eye
- Rejection of the transplanted tissue
- Chronic inflammation
- Double vision
- A droopy eyelid
- Loss of corneal clarity
- Poor vision
- Total loss of vision
- Loss of the eye
- Graft dislocation

Rarely, an infectious disease can occur such as Hepatitis, AIDS, and syphilis. The corneal donor has been tested for these diseases before the tissue is approved and released.

There may also be problems from the local anesthesia such as:

- Perforation of the eyeball
- Damage to the optic nerve
- Droopy eyelid
- Problems with the circulation of the blood vessels in the retina.
- Respiratory depression
- Hypotension
- Rarely, useful vision can be permanently lost.

When to Call

- New or increased drainage from the treated eye.
- Increased or a change in eye pain.
- Increased redness of the eye.

- Decreased clearness of vision in the treated eye.
- If you have any questions.

Treating problems early often results in simple, successful treatment so don't delay. Putting off a call or visit may lead to worse problems.

Who to Call

University Station Eye Clinic
Monday-Friday, 8 am to 4:30 pm
(608) 263-7171 or (800) 323-8942

When the clinic is closed, your call will be sent to the paging operator. Ask for the "Eye Resident on Call." Give your name and phone number with area code. The doctor will call you back.

Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person's health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright © 3/2025. University of Wisconsin Hospital and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#6967