

## **Handout E: Severe Retinopathy of Prematurity**

Multicenter Trial of Cryotherapy for Retinopathy of Prematurity (CRYO-ROP). (1996). *Severe retinopathy of prematurity*. [Brochure]. Portland, OR: Oregon Health & Science University, Casey Eye Institute.

Most babies who have retinopathy of prematurity get better on their own and do not have any serious eye problems. But for a small number, the disease gets worse very fast and can cause serious loss of vision. In those few eyes with very bad ROP, medical studies tell us that without treatment about half will end up with blindness that cannot be corrected with glasses. You are getting this information now because your baby has at least one eye with ROP that is getting more severe.

### **WHAT CAN BE DONE ABOUT SEVERE RETINOPATHY OF PREMATUREITY?**

Until recently, there was no treatment to keep severe retinopathy of prematurity from getting worse. Now we know that cryotherapy or laser therapy can help in many cases. These therapies are surgical procedures often used to help various eye problems in older children and adults. Every surgery has risks and because we don't completely know how these treatments will affect the eyes of children as they grow older, your doctor won't recommend this surgery unless your baby's ROP becomes severe.

On the average, treatment will reduce the chances of blindness by about 24 percent.

### **WHAT ARE CRYOTHERAPY AND LASER THERAPY?**

These treatments are used to kill certain tissues.

Cryotherapy involves holding a cold probe repeatedly on the surface of the eye to freeze through the outside wall of the eyeball into the retina (the inside lining of the eyeball). The cold temperature destroys a part of the retina where the blood vessels have not grown.

Laser treatment is done with a bright laser light beam aimed through the eye's pupil by the surgeon. Hundreds of small laser treatment spots are placed to burn off some of the retina where the blood vessels have not grown.

### **HOW DOES THIS TYPE OF SURGERY HELP THE VISION?**

In order to save the important central vision used for reading and seeing details, we are destroying the part of the retina that gives the farthest peripheral (side) vision.

Destroying this part of the retina slows the progression of ROP, and helps stop ROP before too much scar tissue is formed. This scar tissue can cause permanent vision problems, including blindness for some babies.

The entire part of the retina without blood vessels must be treated. Usually one cryotherapy or laser therapy session is enough to do this. If a second operation is needed, it would usually be done within 14 days of the first treatment.

## **TREATMENT—WHAT HAPPENS?**

Preparing the baby for surgery takes 30-60 minutes and the operation itself takes about 60 minutes. The doctor will explain the anesthesia to you and recommend a specific kind that will work well for your baby. Some babies undergo treatment with general anesthesia so that they sleep quietly. Others may do well remaining awake, with only a local anesthetic to prevent pain. In some cases a compromise is used so that the baby is treated while under sedation, and local anesthesia is administered. The baby may receive anesthesia intravenously, or by an injection into the tissues surrounding the eye, or by breathing gas. Sometimes the treatment is done in an operating room. As with many kinds of operations or treatments, the premature baby may need help to breathe during the treatment. The doctors may decide to place him or her on a mechanical respirator with a tube in the windpipe. This may also help control movement and make it safer to give pain medication.

The thin transparent tissue that covers the white of the eyeball is called the conjunctiva. For some infants having cryotherapy, the doctor needs to make several small cuts (incisions) in the conjunctiva. Doctors do this for almost all eye surgical procedures. There is a possibility of infection whenever an incision is made, so antibiotics would be put on the treated eye(s) for several days following surgery.

## **ARE THERE ANY RISKS TO THE BABY?**

Generally, the risks of this treatment are small and no more than the risks of any kind of surgery on a premature baby. The primary risk comes if a respirator is needed, as it might take time for the baby to breathe without it again, especially if there have been problems getting off a respirator in the past. There are also possible hazards to the trachea (wind pipe) from having the tube placed there, as with any premature baby on a respirator. Complications from general anesthesia for other surgical conditions have occasionally resulted in death, but it is very unlikely that death would occur as a result of treatment for ROP. In a national study of very premature babies, no deaths occurred among 265 babies who had cryotherapy, about a quarter of them under general anesthesia.

## **ARE THERE RISKS TO THE EYE ITSELF?**

The tissues around the eyeball may be very swollen for about five days after treatment. The discomfort the baby feels from the treatment does not seem to seriously affect a baby's overall health.

Complications involving the eye itself are possible. For example, minor bleeding inside the eye occurs 22 percent of the time. Bleeding can occur from retinopathy of prematurity even if a baby doesn't have cryotherapy or laser therapy, but it is sometimes brought on during these procedures. The blood eventually clears up on its own.

Pressure on the eyeball during the treatment can stop circulation of blood to the optic nerve. This happens in less than one percent of the treated eyes and seldom damages vision.

Eyes treated exclusively with the laser are less red and puffy than after cryotherapy, and treatment may be both faster and more thorough. However, laser treatment has a greater risk of producing a cataract (cloudy lens of the eye), which is a very serious complication that might require further surgery. Also, laser treatment is newer and has not been scientifically studied as much as cryotherapy has. We think the overall risks of the two treatments balance out to be about the same.

Cryotherapy and laser therapy destroy the part of the retina normally used for far peripheral vision (vision to the side). This means that the peripheral vision in the treated eye will probably be less than normal. However, this is considered a reasonable trade because vision in the "line of sight," used for reading and detailed sight, is more likely to stay good. School-age children who have had this treatment are not aware of any difference in their peripheral vision.

There could also be *long-term* risks to an eye that receives cryotherapy or laser therapy. We know eyes treated with cryotherapy are usually better off up to six years later. But cryotherapy or laser therapy might change the way an eye grows or could affect it as a child grows up, in ways we don't know yet. So far, a few children who received cryotherapy have been watched for as long as ten years, and doctors have not found that the treatment has caused any serious eye problems.

## **WHICH BABIES SHOULD RECEIVE CRYOTHERAPY OR LASER THERAPY?**

Your baby should have every possible chance for better vision. To make sure the treatment fits your child's needs, doctors will closely examine your baby before any decisions are made to perform surgery. The more severe the ROP, the more urgently treatment is recommended. In some cases, the value of cryotherapy or laser therapy is uncertain and the treatment will be done on only one eye. Then both eyes as well as your baby's general health are monitored. If you and the doctors think it is needed, the ophthalmologist can do cryotherapy or laser therapy on the other eye later. In other situations the ROP may be getting worse so fast that surgery should be done on both

eyes right away. Your doctor will talk to you about your choices and what is best medically for your baby.

Please ask your baby's ophthalmologist any questions you have about your baby's eyes, about severe retinopathy of prematurity, or about cryotherapy and laser therapy.

### **WHICH TREATMENT WILL MY CHILD RECEIVE?**

Cryotherapy has been proven safe and effective; laser therapy is believed to have similar effects. In certain cases one treatment may be more easily administered than the other. Your surgeon will discuss the method of treatment that seems most appropriate for your child's eye.

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