Understanding Halo Gravity Traction

What is Halo Gravity Traction?

Halo Traction is a procedure used to reduce the degree of curvature in the spines of children with severe idiopathic or congenital scoliosis. Spinal traction is the gentle pulling of the soft tissue (joints and muscles) to help straighten the spine. A scoliotic curve allowed to reach high degrees of measurement may increase pressure on the lungs and heart. The result can be a decrease in life expectancy by up to twenty years.

Who Needs Halo Traction?

Halo traction is needed by children with severe curves in their spine (80+degrees) who have not had success with other measures of correction, such as serial corrective plaster casting and serial bracing. Halo traction is also needed by those children with high curves who are not eligible for other measures of correction because of congenital defects in their spines. Many of these children are already experiencing stress to their heart and lung functions. Patients with severe infantile, juvenile and adolescent scoliosis and Scheuerman's Kyphosis may be considered likely candidates for halo traction.

What is the Expected Outcome of Halo Traction?

Each child with severe infantile scoliosis will experience a different outcome from this procedure. Many factors, such as the stiffness or flexibility of the spine and whether congenital scoliosis with previous fusion is present, will affect the outcome. The goal of treatment is to **safely** bring the curve to the smallest possible degree and delay spinal fusion (if not already fused) until spine growth is close to finished, or maintain correction achieved via serial casting, bracing or instrumentation. Typically, a curve is reduced by about 50%-60%. The emphasis is placed on the child's heart and lung health and not the number of degrees.

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Application of Halo Traction

While the child is under general anesthesia, a horseshoe shaped metal bar is secured to the skull with 4-8 pins. These pins distribute the traction weight evenly. The number of pins used is in relation to the child's weight. The halo will sit slightly above the eyebrows and reach back to the child's ears. In some cases, it can go completely around the child's head. The pins will hold the halo in place a short distance from the forehead. Once the halo is secured, it is ready to accept the traction weight. Traction is achieved by weights hung from a rope woven through a precise pulley system to the triangle and carabineer attached to the top of the halo. The traction gently pulls against the child's body weight to straighten the spine. The amount of traction weight used is determined by the orthopedic surgeon and depends on the child's body weight (approximately 1/3 of the child's weight).

Traction weight starts light and increases slowly and deliberately until the maximum traction weight for the particular child is reached. The traction weight is decreased at the same deliberate pace, working towards the goal of halo removal, once correction is obtained. Following the placement of the halo, the child will remain in traction at all times. The apparatus for traction is made to fit the bed. To allow for greater mobility, traction is also made to fit a wheelchair and a walker. Therapy services will help the child adapt and resume physical activities. Maintaining strength while in the halo is very important so the child can return to normal activities when the halo is removed.

Your child's orthopedic surgeon will determine whether your child will achieve more correction if wearing a cast during the halo procedure. Children who are scheduled to undergo a VEPTR implant surgery may not require plaster casting during the halo procedure, due to the necessity of maintaining healthy skin pre-surgery.

Possible Complications and Monitoring

Some possible complications from halo traction are: pain and weakness in the neck muscles, swallowing muscles and tongue, pain and weakness in the eyes, infections at the pin sites and neuromuscular complications.

These are rare due to **strict monitoring of the child's neurological functions** through simple tests of the eyes, facial muscles and movement in the arms, legs, toes, etc. Caregivers will be taught how to keep pin sites clean, and nursing staff will monitor the appearance of the skin around the pin sites daily. Check with your child's orthopedic surgeon to see if physical therapy might benefit your child during this process. Any cause for concern should be discussed with your doctor immediately.

Investigating the option of treatment with Halo Traction

Each hospital equipped to provide halo traction treatment will have specific protocols for patient acceptance for the procedure. The following is a general outline of what you might expect:

- Schedule an assessment by a pediatric orthopedic surgeon to evaluate if your child is a candidate for halo traction
- Review with the surgeon what halo traction is, its purpose, and the intended outcome for your child.
- Meet with the anesthesiologist to discuss sedation and your child's allergies to anesthesia or medication in the past.
- Schedule a consultation with pulmonary department to discuss the need for Chest Percussive Therapy (CPT) or other breathing therapies such as Bi-Pap.
- Meet with physicians or the hospital pain team to discuss pain management, pediatric medications and side effects.
- Review teaching material on patient preparation and patient care.
- Tour the orthopedic floor of the hospital and see an example of the traction apparatus mounted to a bed, wheelchair or walker. See examples of the casts and braces used.
- See photos of other kids in halo traction to prepare yourself for what your child will look like. Immediately after application, your child's head may be bruised, red, swollen, and there may be drainage from the pin sites until they have healed.
- Share your child's health history and medical portfolio with the orthopedic surgeon and his team, so unnecessary x-rays and tests are not repeated.
- Pursue an assessment by the physical therapy department to determine your child's pre-traction capabilities and strength.
- Meet with hospital social work staff to discuss psychological implications of being hospitalized for up to three months. Discuss the importance of an emotional support system, and their involvement in helping you and your child maintain a positive outlook and successfully complete the long stay in the hospital. Discuss services that may be available to your family within the hospital, such as referral to hotels offering a medical rate and discounted vouchers for meals in the hospital cafeteria.
- Meet with child life specialists to discuss activities to divert your child, educational services available for school age children, and tour the playroom, movie check-out closet, library, etc. Many hospitals have scheduled activities for the children and Pet Pal programs, where specially trained dogs visit the children.

Preparing the Family for the Halo Traction Procedure

A caregiver should be with the child at all times. Your child could be in the hospital for 8 -12 weeks, depending on the severity of the curve, your child's overall health and strength, and the intended outcome for your child as determined by you and your surgeon. Halo traction is meant to be a gradual process that limits stress on your child's body.

Your child will need help daily with personal care, toileting, eating, transferring in and out of bed, transferring from the wheelchair and walker, pin care and physical therapy. Be willing to learn how to care for your child. Communicate with doctors and nurses regarding your feelings about participating in your child's care. Practice transferring your child before the halo application. Also practice holding the weights and traction to prevent injury.

Your child will also need emotional support and encouragement. Children will react to being away from home. They will react to having their movements changed and restricted. They will react to the pain felt during the first week of traction. Some children will not want to see themselves in a mirror or a photograph. How you respond to your child will largely shape his or her attitude toward the traction process. The first and last weeks of traction are typically the hardest. The caregiver staying at the hospital should prepare to support the child through these difficult times. The support of family and friends during this time helps tremendously. Friends and family can provide special meals, presents and cards to cheer the child, or maybe even sit with your child so the caregiver can take a break. Have someone outside of the situation that you can talk to about your feelings without upsetting your child.

Parent sleeping rooms, showering facilities and laundry facilities are available in many hospitals. Many hospitals are also near hotels that offer a medical rate and charitable housing, such as the Ronald McDonald House.
Decorate your child's room with some of his/her favorite things! A cherished blanket or stuffed animal, music CDs and movies are helpful too.

Preparing the Child for Halo Traction At Home

Seeing pictures beforehand of other children in halos may be helpful. If possible, talk with other families who have gone through the process. Encourage your child to ask questions and make sure those questions are answered. Make sure your child understands the necessity and purpose of the halo traction procedure. Emphasize the fact that the treatment is a short-term hindrance or frustration compared to the lifetime affect it will have on their health and the degree of their scoliosis.

In the Hospital

- **Clothing**: Your child will be most comfortable in loose fitting clothing. Button-down tops work best. If your child is in a cast, elastic pants are recommended.
- **Bathing**: When bathing, only baby shampoo should be used. The chemicals in other products can react with the metal used in the halo and pins.
- **Diet**: Maintaining your child's weight during traction is important. A regular diet may be resumed soon after surgery. Supplemental items may be used to add calories if needed. Because the traction limits movement of the head and neck, it will be necessary to encourage your child to take small bites and chew them well. Use a straw for drinking. Small, frequent meals that are nutritious and high in calories are best.
- **Sleeping**: Your child will be in traction while sleeping. A rolled towel or small pillow can be used for head and neck support. An egg crate or foam pieces can be added to the hospital mattress for more comfort. The bed should also be tilted in Reverse Trendelenberg, so the head is higher than the feet. This adds the pull of gravity to the traction while your child is lying down.
- **Physically handling your child**: At first your child may feel awkward and unsteady in the traction. Once he or she gets used to the traction, moving around will be easier. You will be helping your child move from a wheelchair, walker and bed. Nurses and physical therapists will help you learn which movements are safe for your child.
- **Pain management**: Each child will experience pain in varying degrees. Medications are used to control your child's pain. Good pain control is crucial to your child's recovery from the halo application. Pain medication may also be used at night, so your child can sleep. Rest is important to maintain strength and a positive attitude. Your child's pain should decrease over time. Discuss all pain medications and their side effects with your doctor. Many pain medications cause constipation. Laxatives, high fiber food and plenty of fluids help counteract this side effect. Never hesitate to communicate your concerns about your child’s recovery with his/her doctor. Communication with your child’s doctor is crucial in ensuring your child has a quick recovery.

When Halo Traction is Complete

When your orthopedic surgeon feels the intended outcome has been reached or maximum correction has been achieved, the halo (and, in some cases, the cast) will be removed. If your child will be braced, a mold of your child's body will be taken to make a brace. There are many different kinds of braces with many specific purposes. After the brace is made, your child will wear it for approximately two weeks, while the traction weights are systematically decreased. Frequent brace adjustments may be needed based on the complexity of the brace. Your child may experience some aching and discomfort during the weight decrease and transition into the brace. A slight loss in correction may also occur.

After the halo is removed, your child's neck muscles will be weak and need support. A soft, removable neck collar is suggested to support those muscles until they are regained through physical therapy. Before being released from the hospital, your child must feel comfortable in the brace. (Caregivers must also feel confident about taking care of their child while in the brace.)

Your physician will tell you how many hours per day the brace is to be worn. It is important that those instructions be followed to maintain the correction achieved through halo traction. Your physician will also inform you of how often to come in for follow up visits to check the fit of the brace and how the curve is maintaining. New braces will be made as your child grows. A brace should be worn as long as it is successful in maintaining your child's improved scoliotic curve.

Brace Care

Caregivers should be taught how to properly put the brace on and take it off. Make sure you feel comfortable doing this before leaving the hospital.

- Bathing and skin care: The brace may be removed for bathing. It is best to wash your child's hair at this time as well. No lotions, creams or powders should be used on your child’s back. These items can irritate the skin. Alcohol can be wiped on your child's skin to toughen it up and prevent itching, rashes, sores, pimples and smelly odors.
- Clothing: Necklines may need to be larger to fit over the brace.
- Diet: As with casts, food should be cut into small bites and well chewed, and straws used for drinking. The brace may also put pressure on the abdominal wall, so small, frequent, nutritious meals, high in calories are best. Some weight loss may be expected, and supplements can also be used to help your child maintain weight and strength.
- Movement: Continue to follow the precautions you learned in the hospital for lifting your child and helping him/her sit up or get out of bed.
- Exercise: Your child may require physical therapy or some type of respiratory therapy. Caregivers should be familiar with these exercises and how to perform them.

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