

选择性背神经根切断术

一种降低痉挛以辅助行走的手术

选择性背神经根切断术是一种下脊髓部位的手术，目的是降低腿部的痉挛或肌肉高度紧张。切断某些引起肌肉高度紧张的异常神经纤维。手术的目的是松弛肌肉，从而提高您的孩子的活动能力及其活动质量。

痉挛是什么？

痉挛是肌肉紧张度增加，可描述为僵直或肌肉拉紧。痉挛的原因因为脑部和肌肉之间命令肌肉放松的信息中断。脑部或脊髓的疾病或损伤可导致痉挛。

我怎么知道选择性背部神经根切断术适合我的孩子？

经过肌肉紧张度外科诊所（STM）的仔细筛查后，我们由医生、外科医生及康复治疗师组成的团队将确定该手术是否适合您的孩子。我们将与您及您的孩子的社区治疗师合作，来确定治疗目标，并在术前创建一项护理计划。您的孩子的评估将包括西雅图儿童医院的一位物理治疗师（PT）及一位职业治疗师（OT）进行的肌肉测试。

术前将做什么？

您的孩子在术前将有一系列门诊预约。这些预约的目的是搜集详细的病史，包括近期疾病及过去术中麻醉的经历。这些预约将安排在您的孩子手术前 30 天内，一般会在同一天完成：

麻醉前手术服务（PASS）门诊

一位执业护士（NP）将与您及您的孩子见面，以确保您的孩子的健康程度足以接受术中麻醉。他们将确保您的孩子无任何可能延迟手术的健康问题。

神经外科门诊

一位执业护士（NP）将与您及您的孩子见面，以搜集您的孩子的病史信息。他们还将完成体格检查评估。

放射技术

神经外科医生将需要对您的孩子进行额外的 X 光或 MRI 扫描，以在术中使用。如果您的孩子不能保持静卧，则需要先在 MRI 检查前进行麻醉。在安排这些预约前，我们将与您就此进行讨论。为了做好准备，您可以观看苏醒状态下进行 MRI 检查的视频 (www.youtube.com/watch?v=ozrg1J5evJ0)，或麻醉状态下进行 MRI 检查的视频 (www.youtube.com/watch?v=q6S978T_olo)。

治疗

在为您的孩子安排 SDR 之前，将由一位物理治疗师（PT）和职业治疗师（OT）查看您的孩子，进行手术评估。如有必要，治疗师可在术前多次查看您的孩子，以获得其肌肉和运动的特定测量信息。治疗师还将

录制您的孩子进行各种活动的视频，如行走、爬楼梯或坐到轮椅上或从轮椅上起身。

预约时需要携带什么？

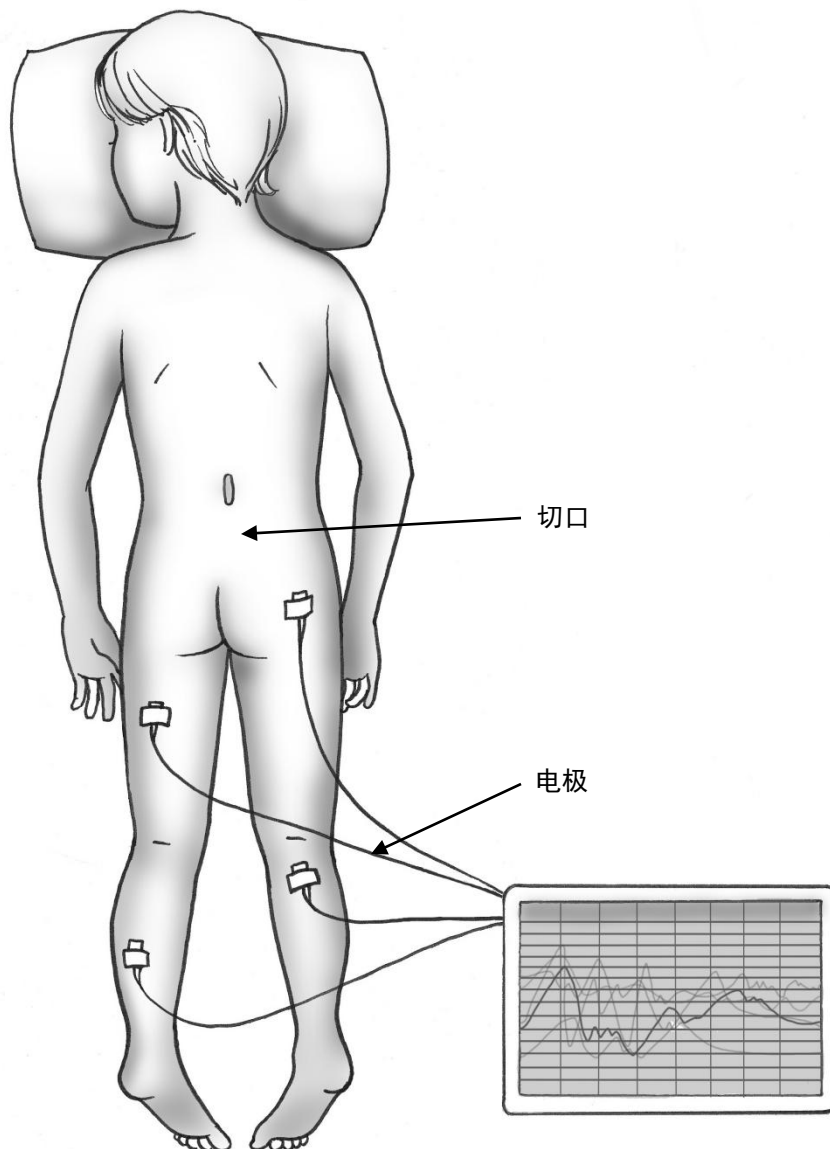
将您的孩子正在使用的以下所有东西携带至预约门诊：

- 轮椅
- 足部或腿部支具或夹板
- 行走辅助用品，如手杖、腋杖或助步器
- 在您离开医院后照护您的孩子的物理治疗师的姓名和电话号码

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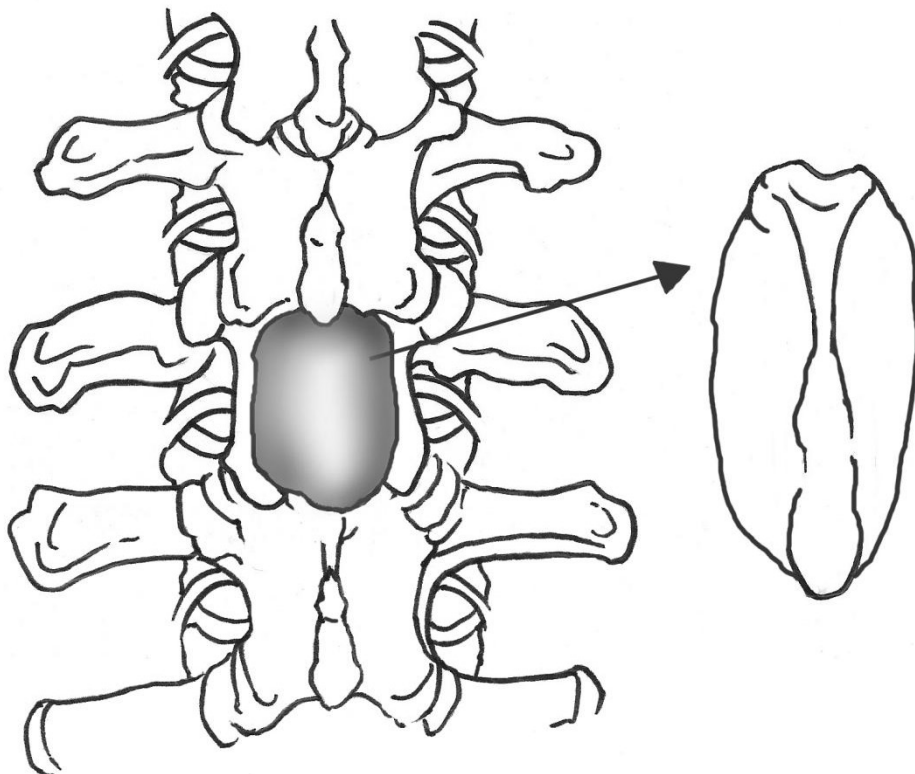
术中将会发生什么？

您的孩子在术中将进入睡眠（全身麻醉）状态。孩子入睡后，我们会将小电极置于孩子的腿上，以捕获肌肉如何应答称为“神经刺激”的信息。该信息以波形显示在计算机显示器上，医疗团队将使用这些信息决定需要切除的神经。一旦放置电极，神经外科医生将在下腰中部做一个小切口（切开）（约1英寸长）。



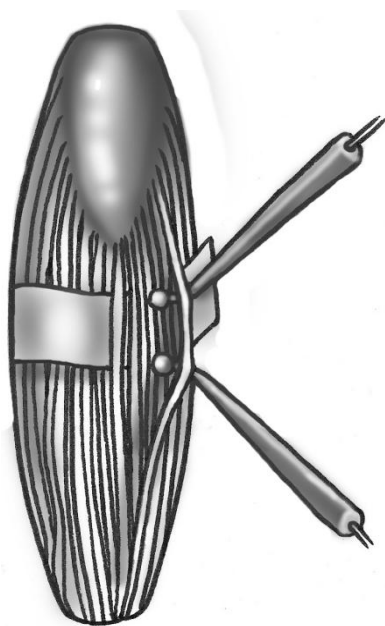
孩子的下腰切口以及连接至计算机显示器的电极。

通过这个切口，在脊柱上开一个小窗（椎板切除术），以暴露神经纤维（背根）。



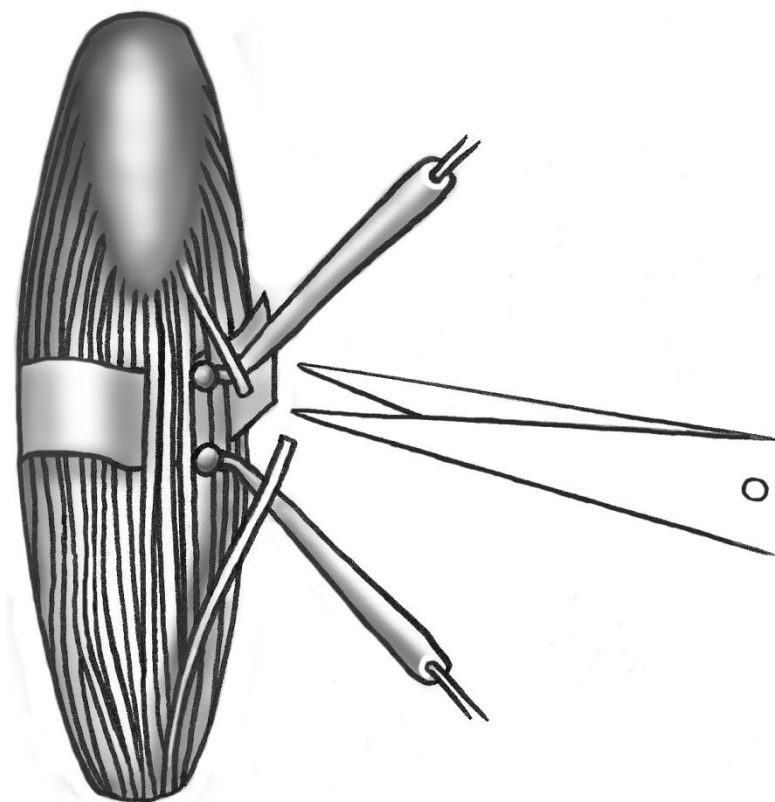
脊柱上的小窗（椎板切除术）

采用神经刺激测试每根神经，以发现异常应答的神经（选择性）。



测试神经纤维

然后手术切断异常神经纤维（脊神经根切断术）。



异常神经纤维切断

每个孩子要切除的神经及切除的数量各不相同。这种治疗可以长期改善肌肉紧张度，因为神经将不会长回来连到一起。

术后应该有何预期？

疼痛和舒适

您的孩子术后可能感觉到一些背部疼痛和不适。还会有一些腿痉挛，预期会在接下来几天内消失。神经外科和疼痛团队将会每天帮助管理您的孩子的不适。

活动

术后头 3 天，您的孩子必须卧床。您的孩子可以仰卧、侧卧或俯卧。这些位置允许背部切口愈合，并将腿痉挛降到最低。

然后您的孩子将被转移至住院病区，开始治疗约 2-3 周。该治疗重点集中在增加您的孩子的力量和肌肉控制，尤其注重行走。我们鼓励您参与。您将受到新的处理或转移技术培训，您可以用来辅助您的孩子练习新的活动。这些课程将会向您提供提问的机会，以及与团队合作，辅助您的孩子变得更强壮，活动更灵活。

您孩子的 PT 和/或 OT 将建议特定的短期活动限制，以保护孩子的安全。随着治疗进展，PT 和 OT 将设置治疗的具体目标，并要求您辅助。

孩子在医院时需要什么？

您的孩子需要携带以下治疗所需的東西：

- 设备：轮椅、支具、助步器、拐杖
- 衣物：带有弹性腰带的裤子和短裤、内裤、袜子、拖鞋及 T 恤衫（我们提供睡衣裤，有洗衣机供您使用）
- 个人物品：眼镜、助听器、梳子/牙刷（我们提供牙刷和牙膏）
- 舒适物品：喜欢的毯子、填充动物玩具、书籍、游戏、照片
- 不打滑的鞋子（及其裸足矫形器（AFO））

您的孩子可能需要特殊设备，以辅助术后在医院内以及回家后的一段时间内行走。如果您的孩子没有特定设备，SDR 团队能够帮忙安排从医疗设备零售商处租借。请注意这可能需要数周的时间。

如果您在术前计划对您的孩子的座位系统或矫形器进行改装，请告诉 SDR 团队。因为您的孩子的需要在术后可能改变，因此也许有必要延迟这种服务。

我如何为我的孩子做准备？

寻找关于为您的孩子做准备的信息及资源，请访问

www.seattlechildrens.org/patients-families/surgery/preparing-your-child/。

此外，我们的儿童生活专家可与您及您的孩子合作以缓解紧张情绪，表达担忧及恐惧，并对住院经历感到更有把握。更多信息访问

www.seattlechildrens.org/clinics-programs/child-life/。

如果您想约见一位儿童生活专家或与其通电话，请询问 SDR 团队。

我的孩子是否需要停止口服巴氯芬或其他药物？

您的康复医生将在术前会与您交流关于您的孩子的用药计划及术前术后需要改变之处。

我的其他孩子怎么办？

在门诊预约期间

门诊儿童游戏室是在患者及看护人门诊就诊时，兄弟姐妹玩耍的地方。游戏室欢迎 3-11 岁受过如厕训练的儿童，先到先参加，最长可以待 2 小时。有成人陪伴时，欢迎患者和幼儿进入游戏室。

术后

我们的住院游戏室是一个充满欢乐、安全、支持性游戏及社交互动的地方。儿童喜好活动及玩耍，以及不同类型的书籍、玩具和手工艺品。在成人家属陪伴下，欢迎患者及其兄弟姐妹进入游戏室。受过训练的志愿者可以辅助游戏室或患者病房的活动。

了解进一步详情

- 肌肉紧张度管理项目经理
206-987-5917 或
tone@seattlechildrens.org
- 神经外科预约
206-987-2544 ,
选项 2
- 康复内科预约
206-987-2114 ,
选项 2
- 询问您的孩子的健康医疗提供者
- www.seattlechildrens.org/SDR

门诊和住院

Mountain Play 公园是一处供所有患者、家属及来访者活动的外部游戏区。玩耍不受工作人员监督。关于这些服务的更多信息，请访问 www.seattlechildrens.org/visitors/campus/recreation/。

寄宿和交通怎么样？

欢迎家属和成人医疗护理提供者在室内与孩子在一起。年龄低于 18 岁的兄弟姐妹和访客不允许在医院过夜。如果其他家庭成员需要在附近居住，客服部可以帮您寻找住处。您可以通过 206-987-9330 或 866-987-9330 联系客服部。我们还有淋浴间可供使用。

关于这些服务的更多信息，请访问 www.seattlechildrens.org/visitor/。

我能携带食物吗？

您可以从家中携带食物。如果您的孩子有任何特殊的食物需求，请告知 SDR 团队医院在准备餐饮时应该了解哪些事项。

在病区的日间室中还有可以储存易腐食物的家用冰箱，以及病区所有儿童的家属共用的炉台和烤箱。非易腐食物可以放在您的孩子的病房内。

我的孩子在住院期间是否能够离开医院？

一旦诊疗团队确定您的孩子可安全地离开医院，我们可以为您的孩子提供日间及过夜离院通行证。您的孩子必须有一名成人全程陪同。

您的孩子离开医院的时间长短必须由孩子的诊疗团队决定。在带孩子离开前，我们将与您交谈。一些孩子在离开医院过夜后返回医院住院时存在困难。在离开前，考虑您的孩子将如何应对返回医院。对于一些孩子来说，日间通行证是较好的选择。

在我们返回家中时，我们应该期待什么？

从医院回家后（出院），您的孩子需要接受门诊治疗，每周 3-5 次，长达 1 年。该治疗在您的孩子出院回家后 1 周内开始，可能包括个人治疗和基于学校的治疗。您的孩子术后的进步需要长期投入。持续治疗对于辅助您的孩子达到术后目标非常重要。除了物理治疗，您的孩子每周还需要接受几次职业治疗，时间长达 1 年。

返校

如果您的孩子上学，西雅图儿童医院的老师将联系您的孩子学校的辅导员或班级老师，以辅助返校后顺利过渡。我们将要求您的孩子的老师在术前填写“返校过渡”问卷。该信息将辅助我们教育团队创建一个计划，与您孩子的老师及返校前的治疗师分享。

如果学校工作人员或治疗师对康复团队有疑问，可以在孩子回家时或之后立即得到解决。

免费口译服务

- 请在医院中向您的孩子的护士询问。
- 在医院外，请拨打免费家庭口译专线电话 1-866-583-1527。告诉口译员您需要通话的人的姓名或分机号码。

医疗随访

您的孩子术后将在神经外科、康复内科及物理/职业治疗科（OT/PT）就诊，以检查进展状况。我们在西雅图儿童医院的调度程序员将会给您打电话，进行以下预约：

术后	3 个月	6 个月	1 年	1.5 年	2 年
神经外科	X				
OT/PT	X	X	X	X	X
康复	X	X	X	X	X

西雅图儿童医院向聋人、听力障碍者或不会讲英语的患者、家庭成员和法律代表提供免费口译服务。西雅图儿童医院将应请求用其他格式提供本信息。请打电话给家庭资源中心，电话号码 206-987-2201。

本手册已经由西雅图儿童医院的工作人员审阅。但是，您的孩子的需求具有独特性。在您根据本信息采取行动或依赖本信息之前，请向您的孩子的健康护理服务提供者洽询。

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2015 年 10 月

PE1293SC



Selective Dorsal Rhizotomy

A surgery to reduce spasticity to help with walking

Selective dorsal rhizotomy is a surgical procedure done on the lower spinal cord to reduce spasticity or high muscle tone in the legs. Certain abnormal nerve fibers that cause high muscle tone are cut. The goal of surgery is to relax the muscles, therefore improving your child's ability to move as well as their quality of movement.

What is spasticity?

Spasticity is an increase in muscle tone that can be described as stiff or tight muscles. Spasticity is caused by a disruption in the messages between the brain and the muscles that tell the muscles to relax. Spasticity can be a result of illness or injury to the brain or spinal cord.

How do I know if selective dorsal rhizotomy is right for my child?

After careful screening in the Surgical Tone Management (STM) Clinic, our team of doctors, surgeons and rehabilitation therapists will determine if this procedure is appropriate for your child. We will partner with you and your child's community therapist to identify goals and create a care plan before surgery. Your child's evaluation will include muscle testing by a physical therapist (PT) and an occupational therapist (OT) at Seattle Children's.

What happens before surgery?

Your child will have a series of clinic appointments before surgery. The purpose of these appointments is to gather a detailed medical history, including recent illnesses and past experience with anesthesia during surgery. These appointments are scheduled within 30 days of your child's surgery, usually all on the same day:

Pre-Anesthesia Surgical Services (PASS) Clinic

A nurse practitioner (NP) will meet with you and your child to make sure your child is healthy enough to receive anesthesia during surgery. They will make sure your child does not have any health problems that could delay their procedure.

Neurosurgery Clinic

A nurse practitioner (NP) will meet with you and your child to collect information about your child's medical history. They will also complete a physical assessment.

Radiology

The neurosurgeon may need additional X-rays or MRI scans of your child to use during surgery. Your child may need anesthesia before an MRI if they are not able to lie still. We will talk with you about this before scheduling these appointments. To prepare, you can watch the videos [Getting an MRI While Awake \(www.youtube.com/watch?v=ozrg1J5evJ0\)](http://www.youtube.com/watch?v=ozrg1J5evJ0) or [Getting an MRI with Anesthesia \(www.youtube.com/watch?v=q6S978T_olo\)](http://www.youtube.com/watch?v=q6S978T_olo).

Therapy

By the time your child is scheduled for an SDR, they will have already been seen by a physical therapist (PT) and occupational therapist (OT) for their surgical evaluation. It may be necessary for the therapists to see your child one more time before surgery to gather specific measurements of their muscles and movement. The therapists may also videotape your child doing various activities like walking, climbing stairs, or transferring to and from a wheelchair.

What do I bring to appointments?

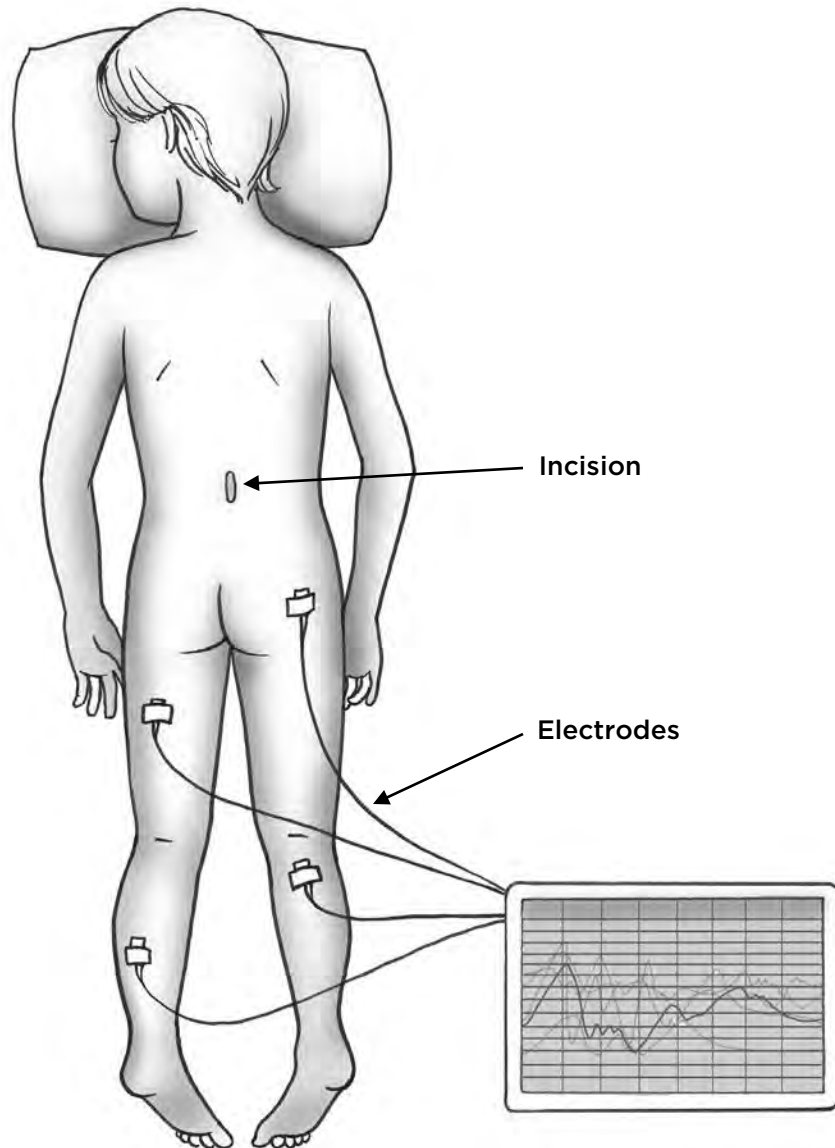
Bring all of the items below that your child is currently using to their appointments:

- Wheelchair
- Braces or splints for the foot or leg
- Walking aids such as a cane, crutches or walker
- Name and phone number of the physical therapists who will be working with your child after you leave the hospital

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What happens during surgery?

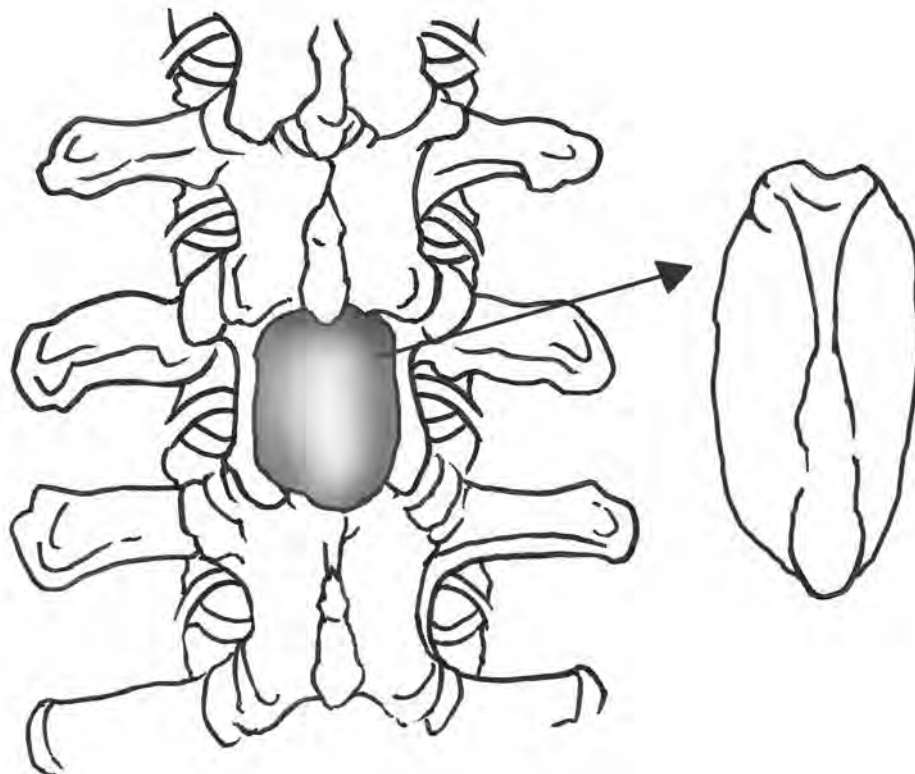
Your child will be asleep (general anesthesia) during the surgery. After your child is asleep, small electrodes are placed on the legs to capture information on how the muscles respond to testing called “neurostimulation” during the surgery. This information appears on a computer screen as wave forms that the team will use to decide which nerves to cut. Once the electrodes have been placed, the neurosurgeon will make a small cut (incision) in the middle of the low back (about 1 inch long).



Child with a lower back incision and electrodes that are connected to a computer screen.

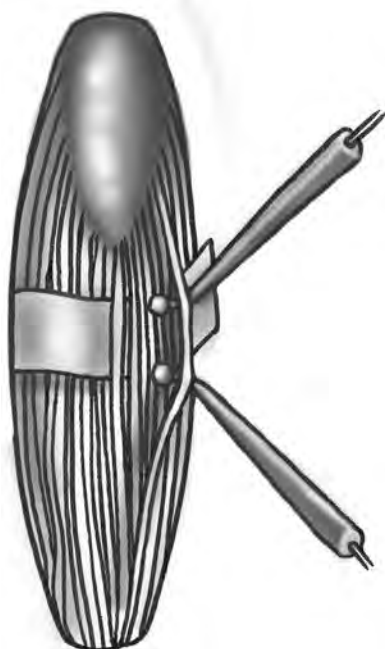
Selective Dorsal Rhizotomy

Through this incision, a small window (laminectomy) is made in the spine to expose the nerve fibers (dorsal roots).



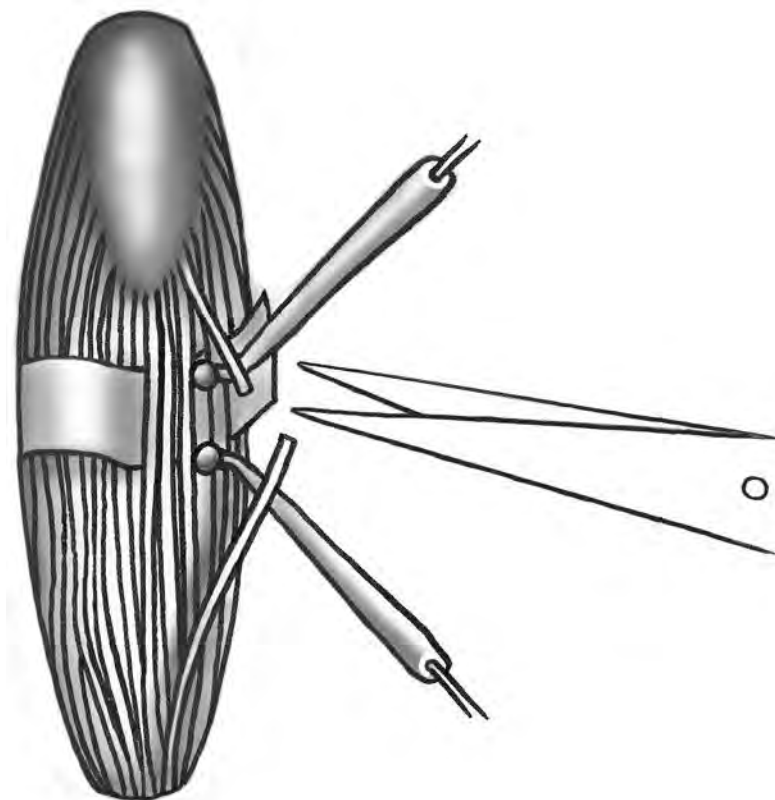
Small window in the spine (laminectomy)

Each nerve fiber is tested with neurostimulation to find out which nerves respond abnormally (selective).



Testing nerve fibers

The abnormal nerve fibers are then surgically cut (rhizotomy).



Abnormal nerve fiber cut

Which nerves and how many are cut will vary from child to child. This provides a long-term improvement in muscle tone because the nerves will not grow back together.

What should I expect after surgery?

Pain and Comfort

After surgery, your child may feel some pain and discomfort in their back. They may also have some leg spasms which are expected to go away over the next few days. The Neurosurgery and Pain teams will help manage your child's discomfort each day.

Activity

For the first 3 days, your child will have to stay in bed. Your child can lie flat on their back, on their side or stomach. These positions will allow the incision on their back to heal and minimize leg spasms.

Your child will then be moved to the Inpatient Rehabilitation Unit to begin therapy for approximately 2 to 3 weeks. This therapy will focus on increasing your child's strength and muscle control, with a special focus on walking. You are encouraged to participate. You will be coached on new handling or

transfer techniques that you will be using to assist your child in learning new movements. These sessions will give you an opportunity to ask questions and to partner with the team in helping your child become stronger and more mobile.

Your child's PT and or OT may suggest specific short-term activity restrictions to keep your child safe. As therapy progresses, the PT and or OT will set specific goals for therapy and ask you to assist with these.

What will my child need at the hospital?

Your child will need to bring the following items for therapy:

- Equipment: wheelchair, braces, walker, crutches
- Clothing: pants and shorts with elastic waistbands, underwear, socks, slippers and T-shirts (we provide pajamas and have laundry machines for you to use)
- Personal items: eyeglasses, hearing aids, comb/brush (we provide toothbrush and toothpaste)
- Comfort items: favorite blanket, stuffed animal, books, games, photos
- Non-skid shoes (with their AFOs)

Your child may need special equipment to help them get around after surgery in the hospital and for a while after your child goes home. If your child does not already have the necessary equipment, the SDR team can help make arrangements to rent from a medical equipment vendor. Please be aware that this may take several weeks.

Tell the SDR team if you have plans for your child to have their seating system or orthotics refitted **prior to surgery**. It may be necessary to postpone this service as your child's needs may change after surgery.

How do I prepare my child?

For information and resources about preparing your child, visit www.seattlechildrens.org/patients-families/surgery/preparing-your-child/.

In addition, our Child Life specialists can work with you and your child to help relieve tension, express concerns and fears, and feel more in control about their hospital experience. Visit www.seattlechildrens.org/clinics-programs/child-life/ to learn more.

If you would like to meet with a Child Life specialist or speak with them over the phone, please ask someone on the SDR team

Will my child need to stop taking oral baclofen or other medicines?

Your Rehabilitation doctor will talk to you before surgery about your child's medication plan and any changes that may need to be made before and after surgery.

What do I do with my other children?

During clinic appointments

The clinic sibling playroom is a place where brothers and sisters can play while patients and caregivers go to a clinic appointment. The Sibling Playroom welcomes children ages 3 to 11 years old who are toilet-trained, on a first-come, first-served basis. They may stay for up to 2 hours. Patients and younger children are welcome in the Sibling Playroom when an adult is with them.

After surgery

Our inpatient playroom is a place for fun, safe, supportive play and social interaction. Children enjoy activities and entertainment, as well as a wide variety of books, toys and crafts. Patients and their brothers and sisters, accompanied by an adult family member, are welcome in the playroom. Trained volunteers are available to help with activities in the playroom or in patient rooms.

Clinic and inpatient

The Mountain Play Park is an outside play area for all patients, families and visitors. Play is not supervised by staff. For more information about these services, visit www.seattlechildrens.org/visitors/campus/recreation/.

What about lodging and transportation?

Parents and adult caregivers are welcome to stay in the room with your child during the night. Siblings and guests under 18 years of age are not permitted to stay overnight at the hospital. If other family members need to stay close by, Guest Services can help you find housing. You can contact Guest Services at 206-987-9330 or 866-987-9330. We also have showers available.

For more information about services, visit www.seattlechildrens.org/visitors/.

Can I bring food?

You are welcome to bring food from home. Please let the SDR team know if your child has any special food needs that the hospital should be aware of when preparing their meals.

There is also a family refrigerator located in the day-room on the unit to store perishable food items as well as a stove and oven that is accessible to all families with children on the unit. Non-perishable food items can be kept in your child's room.

Is my child able to leave the hospital during their stay?

We can offer day and overnight passes to your child once the care team decides they are safe to leave the hospital. Your child must be accompanied by an adult at all times.

To Learn More

- Tone Management Program Manager
206-987-5917 or tone@seattlechildrens.org
- Neurosurgery Scheduling
206-987-2544 , option 2
- Rehabilitation Medicine Scheduling
206-987-2114, option 2
- Ask your child’s healthcare provider
- www.seattlechildrens.org /SDR

Free Interpreter Services

- In the hospital, ask your child’s nurse.
- From outside the hospital, call the toll-free Family Interpreting Line 1-866-583-1527. Tell the interpreter the name or extension you need.

The amount of time your child can be away from the hospital will be decided by your child’s care team. We will talk to you before bringing this up with your child. Some children have a difficult time returning for the remainder of their stay after leaving the hospital for the night. Before leaving, consider how your child will cope with their return to the hospital. A day pass is a better option for some children.

What should we expect when we return home?

After going home (discharge) from the hospital, your child will need outpatient therapy 3 to 5 times each week for up to 1 year. This therapy should start within 1 week after your child goes home from the hospital and may be a combination of private therapy and school-based therapy. Your child’s progress after surgery requires a long-term commitment. Consistent therapy is important to help your child meet their goals following surgery. In addition to physical therapy, your child may also have occupational therapy several times each week for up to one year.

Return to school

If your child attends school, Seattle Children’s school teachers will contact your child’s school counselor or classroom teacher to assist with making a smooth transition back to their school. We will ask your child’s teacher to complete a “Transition Back to School” questionnaire before surgery. This information will help our Education team create a plan to share with your child’s teacher and therapists before your child returns to school.

If school staff or therapists have questions for the rehabilitation team, they can be addressed when it is time to go home, or soon after.

Medical follow-up

Your child will be seen by Neurosurgery, Rehabilitation Medicine and Physical/Occupational Therapy (OT/PT) after surgery to check their progress. Our schedulers at Seattle Children’s will call you to make the following appointments:

After surgery	3 months	6 months	1 year	1.5 years	2 years
Neurosurgery	X				
OT/PT	X	X	X	X	X
Rehabilitation	X	X	X	X	X

Seattle Children’s offers interpreter services for Deaf, hard of hearing or non-English speaking patients, family members and legal representatives free of charge. Seattle Children’s will make this information available in alternate formats upon request. Call the Family Resource Center at 206-987-2201.

This handout has been reviewed by clinical staff at Seattle Children’s. However, your child’s needs are unique. Before you act or rely upon this information, please talk with your child’s healthcare provider.

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