

# ApiFix Mid-C System guide

orthopedic center for spinal and pediatric care



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# welcome to the orthopedic center for spinal and pediatric care at Dayton Children’s Hospital

Thank you for choosing us to care for your child.

We have more than 290,000 reasons to make sure the care we provide is just right. That is the number of infants, children and teens who walk through our doors each year and receive care by our exceptional team of pediatric experts.

Kids come first and they always will. Everything, from our colorful, kid-friendly décor to our state-of-the-art technology, is designed with safety and comfort in mind. It is always our goal to go above and beyond to provide the highest quality of care for your child.

Our main mission is to provide quality health care for children from birth through teenage years. We strive to be a health care resource for all children in our region. Through our compassionate team of pediatricians, pediatric specialists and clinical staff, we offer comprehensive care in an emotionally supportive setting.

This guide, in combination with the Apifix Mid C-System Patient Guide provided to you, will walk you through before, during and after spine surgery. Words that are **bolded** throughout the book are defined at the end in the glossary. These are words that you may hear a lot, but may not know what they mean.

For simplicity, we will use “you” to refer to the patient throughout. Using one reference term, rather than “you/your child” throughout will make the document easier to read. However, we know that our patients will need their parents’ help and support throughout surgery and recovery. This is a resource for them too. We encourage them to read through this binder and be actively involved in your care.

## **extra training for exceptional professionals**

Our team of surgeons specialize in correcting pediatric spinal deformity. This helps them to better understand the unique needs of growing children and teenagers.

# scoliosis

Every person's spine can curve. A certain amount of curvature is needed for us to balance, move and walk well. Scoliosis is a condition that causes the spine to curve into an 's' shape. If the curve becomes bad, it can be noticeable. If the curve becomes very bad, it can lead to other health problems, sometimes affecting the lungs, heart and muscles.

**3** out of every  
**100**  
people have scoliosis

Scoliosis can happen over time. In most cases it isn't found until a child is between 10 and 14 years old. Most cases of scoliosis don't need treatment. But even when they do, most of the time kids can continue an active life after treatment.

## idiopathic scoliosis

Most people (85%) with scoliosis have the type known as idiopathic, which means the cause is not known. The main reason the spine curves is the uneven growth of the back bones (vertebrae). Idiopathic scoliosis is often seen in family members and may be genetic. Larger curves occur more often in females than males. However, males can also develop a severe spinal curvature.

## what are the signs of scoliosis?

- One shoulder may be higher than the other.
- One shoulder blade may appear to be higher.
- There might be extra space between the arm and the body when arms are hanging at the sides.
- One hip may appear to be higher than the other.
- The head is not centered over the pelvis.
- When bending over (back is flat), one side of the back may appear higher than the other.

### several less common types of scoliosis do have known causes:

- Congenital scoliosis: Defects of spinal vertebrae already present at birth.
- Neuromuscular scoliosis: Disorders of the central nervous system, such as cerebral palsy or muscular dystrophy.
- Connective tissue: Disorders of connective tissue (like Marfan's syndrome).
- Chromosome abnormalities (like Down syndrome).

### scoliosis is not caused by:

- Poor standing posture
- Carrying heavy things
- Poor sleeping posture
- Sports

## diagnosing scoliosis

Some patients show clear signs of scoliosis. Sometimes a curvature of the spine is obvious. The ribs are pushed out or one shoulder blade is noticeably higher than the other one. Other times it's not so obvious. Scoliosis doesn't hurt or happen suddenly, it's not always easy to diagnose.

Some schools in the United States test for scoliosis. The Dayton Children's scoliosis team of doctors and nurses work directly with schools to screen for spinal deformities.

## treating scoliosis

A scoliosis curve of 10 to 15 degrees usually means that nothing needs to be done except for routine checkups until pubertal maturation and growth are done. The curvature of the spine usually doesn't get worse after that point.

Most of the time, scoliosis is mild enough that it doesn't affect a child's life and requires no medical treatment. In some cases, doctors will have a child with scoliosis wear a back brace or do surgery to correct the problem.

If the curve is 20 to 40 degrees, the orthopedist may suggest a **back brace** for younger patients. Keep in mind there is some variation due to minor position changes during the X-ray. This means that the number will change a little from one X-ray to another (up to about 5 degrees), even though the curve hasn't changed.

With the right kind of treatment —whether it involves observation, wearing a brace or surgery— almost every child with scoliosis can have an active, normal life.

### back braces and surgery

About 20% of kids with scoliosis need to wear a back brace. The brace acts as a holding device that keeps the spine from developing more of a curve. A brace won't make the spine straight, but if it does its job well, the curve won't increase more than 5 or 10 degrees and surgery can be avoided.

The many different types of back braces are typically made of lightweight materials. Some braces are made to be worn 18 to 20 hours a day, while others are worn only at night.

Several different types of braces are used. The one that the orthopedist chooses depends on the child, the location of the curve and the severity of the curve. The most common type is a TLSO (thoracic-lumbar-sacral-orthosis) brace, which is a low-profile brace (comes up under the arms and fits beneath clothes). Another common brace is the Providence brace which is only worn at night.

Sometimes, even with a brace, surgery becomes necessary to correct the curvature of the spine. Overall, braces prevent surgery about 70-80% of the time.



### **why we do an ApiFix surgery for scoliosis?**

The main purpose of surgery is to stop the curve from getting worse.

The main probable benefit of the MID-C System is correction and maintenance of the patient's major spinal curve acting as an internal brace below the threshold where spinal fusion is indicated to possibly avoid the need for spinal fusion surgery. The ApiFix Mid-C System is a humanitarian device. This means that it is used when no other device is available to treat a condition. This device is approved by the FDA to be used in patients with certain types of adolescent idiopathic scoliosis.

During the surgery, the ApiFix device is implanted with you lying face down. The surgeon will identify the correct location for implantation using X-ray imaging. The surgeon will access the major curve through an approximately 10-14 cm incision where only half the spine is exposed. Screws are inserted on the concave side at the top and bottom of the major curve. The MID-C implant is then connected to the screws with an Extender. The initial curve correction may be done during surgery to initiate the correction process.

### **what would happen if I don't have surgery?**

Without surgery, the curve will probably get worse causing more visible deformity which may lead to back pain and even lung disease. We do not perform surgery unless absolutely needed.

Studies have shown that curves will continually get worse once they are larger than 50 degrees. On average the untreated curve will change one degree or more per year after the patient becomes an adult. Other nonsurgical treatments like chiropractic manipulations, exercise and diet have not been shown to have an effect on scoliosis.

### **how long does surgery take?**

The surgery usually takes between one to two hours. You should go home in 24-48 hours, and should be able to do normal activities right away (walking, dressing, climbing stairs, etc.) You may need about two weeks off from school to get over the soreness from surgery and regain strength. After about four to six weeks, you can take part in most regular daily activities. After two to three months, you can return to most all activities.



# meet our team

You are in the very best hands at Dayton Children's. The **orthopedic specialists** at Dayton Children's are experts in treating diseases of the **musculoskeletal system**. Our board-certified orthopedic surgeons provide specialized care for teenagers and children. This includes the medical and surgical treatment of the spine, bones, joints, muscles, ligaments, tendons, nerves, skin and their related structures.

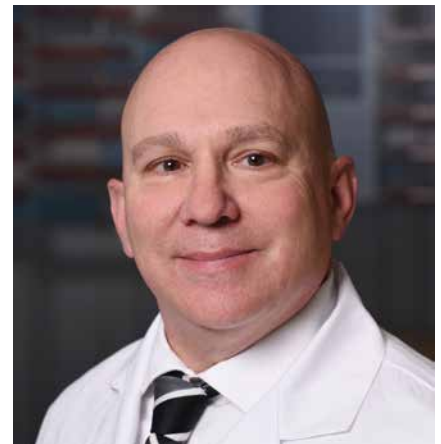
The orthopedic division manages a wide range of pediatric orthopedic care, from simple fractures to the most complicated congenital (something a person is born with) anomalies and deformities.

If you have any questions as a spinal rod patient, you can call the main campus. Use the direct line: 937-641-4881.

## **Michael Albert, MD,** chief of orthopedics

Michael Albert, MD, has been a part of the orthopedics department at Dayton Children's for more than 30 years. He has a bachelor of science from Miami University and received his doctorate of medicine from Wright State University's Boonshoft School of Medicine. Dr. Albert completed a residency in orthopedics at Wright State/Miami Valley Hospital and a fellowship in pediatric orthopedics at Children's Hospital of Philadelphia.

Dr. Albert is board certified in orthopedic surgery and is the current chief of orthopedics at Dayton Children's, as well as an associate clinical professor at Wright State University's Boonshoft School of Medicine.



### **when asked why he chose his specialty?**

"I went to medical school thinking I wanted to become a pediatrician, but once I did surgery and orthopedics, I decided to combine my dedication and love of children's health with orthopedic surgery."

### **special interest: spine deformities**

"Once we correct a child's spine, it improves their quality of life and how they feel about themselves. After surgery, they're eventually back enjoying the sports and activities they want to do. In general, that's what orthopedists do — they improve the quality of life from a physical point of view, which also helps them emotionally."

### **personal interests**

Running, golf and Ohio State football

## Nicholas Gajewski, MD

Dr. Gajewski attended the University of Pennsylvania for his undergraduate degree where he graduated summa cum laude. He went on to graduate with his doctorate of medicine from the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University. Dr. Gajewski completed his post-graduate training at David Geffen School of Medicine at UCLA and Nemours/Alfred I. duPont Hospital for Children in Wilmington, Delaware.

### special interests

Dr. Gajewski has a special interest in treating pediatric spinal disorders and pediatric trauma.

### personal interests

When not seeing patients at Dayton Children's, Dr. Gajewski enjoys spending time with his wife and son, golfing, playing tennis and skiing



## Angela Lu, DNP, FNP-C

Angela received her nurse practitioner degree from Purdue University. She is currently working on her doctorate at The Ohio State University. She is our lead Orthopedic Nurse Practitioner at Dayton Children's. She has 8 years of experience as a trauma nurse at a level 1 trauma center. She also has 6 years of experience in pediatric orthopedics.

### when asked what she enjoys most about her position?

"I really enjoy spinal correction surgery. I love to see the difference before and after surgery in the correction we get."

### personal interests

Teaching dance, traveling, and spending time with her kids





## Hayley Hammersand, CPNP-PC

Hayley Hammersand, CPNP-PC, is a nurse practitioner at Dayton Children's Hospital. She sees patients in Dayton Children's orthopedics clinic and assists with orthopedic surgeries.

Hayley attended Ohio University for her undergraduate degree where she graduated summa cum laude and she attended graduate school at The Ohio State University. Hayley has experience working in pediatric primary care, critical care and surgery.

### personal interests

When not at Dayton Children's, Hayley enjoys golf, hot yoga and spending time with her family.



## spinal care nurse navigator

Our dedicated nurse navigator is here for you and your family every step of the way. Whether you have questions about your surgery or Dayton Children's, you can be confident in knowing you have a reliable resource to guide you every step of the way.

### assistance provided

The nurse navigator is available to answer questions related to your surgery. Common information our nurse navigator can provide includes:

- Scheduling your appointments needed for surgery
- What to expect before and after your operation
- Preparing for your appointment with the physician
- Greeting you and your family the day of your surgery
- Assistance with parking and directions
- Connect with billing resources as needed

### your spinal care nurse navigator

Your nurse navigator, **Jenna Keiffer, BSN, RN, CCRN**, is available to answer your questions.

One Children's Plaza  
Dayton, OH 45404

P. 937-641-5323



# risks and possible complications of spinal surgery

Complications can take place in all types of surgery. For the most part, complications in pediatric spinal deformity surgery are low. The following is a list of some of the major complications that occur in pediatric spinal deformity surgery.

## 1. Neurologic complications

Neurologic complications, mostly in teen-age idiopathic scoliosis, are under 1%. In order to correct your spinal deformity, we place anchor points such as screws close to the spinal cord and nerve roots. We also rotate and reshape the boney spine in order to correct your deformity. This can cause stretching of the nerve roots, the spinal cord and blood flow to the spinal cord. Although very rare, paralysis can occur. To prevent or identify neurological issues during your surgery, we will monitor your spinal cord. This is done to keep track of the movement and feelings of the arms and legs throughout the surgery. This is a very high tech type of monitoring that picks up anything unusual and helps us identify any possible issues.

## 2. Infection

All surgeries have a risk for wound infection. We work hard to make sure before the surgery the skin is clean. Antibiotics are given before, during and after surgery. We have a detailed infection process that includes skin prep, using antibiotics and sterile washing of the spine after surgery is completed. The risk of wound infection in idiopathic scoliosis is less than 1%, but if there is a large amount of drainage or any signs of wound infection, the patient may need to go back to surgery. That would include an irrigation and sterile washing of the spinal wound. This usually takes care of the infection along with antibiotics.

## 3. Bleeding and the need for blood transfusions

In surgery, we use many techniques to decrease blood loss. The risk of blood loss is much reduced with an ApiFix surgery and is very minimal. In case we need a blood transfusion, we use a voluntary community blood bank. The risk of developing an infection from a blood transfusion, such as AIDS or Hepatitis, is over one in a million chance. Blood transfusion reactions can happen too, but your blood type is identified before surgery. Transfusion reactions are also unlikely.

## 4. Implant failure

There is a risk of implant failure of the MID-C System device. This rarely occurs but may later need corrective surgery.

## 5. Junctional problems

Junctional problems can occur at the top and bottom of the device. This is when a deformity occurs above and below the implant. In rare cases, this requires another surgery to correct.

## 6. Gastrointestinal and Genitourinary (GI & GU)

GI issues can happen because of the pain medications given after surgery. Sometimes discomfort of the bowels caused by air (gas) or fluid build up in the abdomen causing expansion to occur, but it improves over time or with medication. In rare situations, patients can develop a bowel obstruction. This is sometimes referred to as SMA syndrome. It gets better with nutrition and rarely needs any surgery to correct.

## 7. Respiratory

Since we are working on the spine near the lungs, air can get into the chest cavity and cause some collapse of the lungs. This may require a chest tube to remove the fluid or air from the lungs. It's very important after surgery to use the spirometer. This device helps with your breathing and expands your lungs to prevent a condition called Atelectasis. This is when small areas of the lung can collapse after surgery. Pneumonias are uncommon but usually improve with antibiotics.

## 8. Dural tears

The dura is a thin lining around the spinal cord. Rarely, a tear can occur causing a spinal fluid leak. Dural tears usually can be repaired. They may lead to a "spinal headache" that improves with bed rest and time.

**This list covers the major risks and complications of surgery, but there are more. If you have any questions or concerns, please talk with your physician.**



# before surgery

## **surgery is stressful – a note to parents**

This can be a very stressful time for you and your child. That's why the time spent getting ready for surgery and recovery is so important. We believe that learning about what is to come and getting answers to your questions can help you feel more comfortable. If you have concerns, we encourage you to talk to our nurse navigator about them. While we are very good at what we do, no one knows your child better than you. We encourage you to be an advocate for your child. If you feel something isn't right, please let us know. Our staff can connect you with resources to help with your child's emotional health. You will be able to stay with your child while they are in the hospital.

## **before your child's surgery:**

- Contact your child's insurance company for any special requirements.
- Contact your child's school office to let them know that your child will be missing school. The school may need to arrange for homework assignments or a tutor for an extended absence.
- Let us know of any special needs (for example, language interpreters).

## **preparing for surgery**

About two to three weeks before surgery, you will be scheduled for pre-surgery teaching and testing in the surgery area.

## **During your pre-surgery teaching, you will:**

- Meet with a member of our anesthesia team.
- Receive pre-surgery education and go over post-surgery expectations.
- Meet with the nurse practitioner to complete the history and physical exam required for surgery.
- Confirm any allergies (including an allergy to metal).
- Obtain height and weight.
- Receive a bottle of special soap for bathing the night before surgery.
- Have blood work done as ordered by your surgeon.
- Have X-rays taken at medical imaging (this may take up to an hour).
- Learn how to use the incentive spirometer (device used to help you breathe after surgery).

- Have a pre-surgery photo taken (this will also be done after your surgery).
- Tour the units where you will be taken care of.
- Schedule your post-surgery follow up appointment.

If your family doesn't live close to Dayton Children's, please ask us about staying at the Ronald McDonald House. The Ronald McDonald House is located across the street from Dayton Children's. It offers families many of the comforts of home, such as hot meals, on site laundry and private guest rooms at little or no cost to them while their child is receiving inpatient medical care. Ronald McDonald House also offers transportation to and from the hospital. Ask a nurse for an application, or pick one up in the Ronald McDonald Family Room located on the fourth floor between the yellow and purple elevators.

### **tour of inpatient units**

As part of your pre-surgery teaching, you will be given a tour of the units where you will be admitted. You may spend time in the pediatric intensive care unit, which the surgeon and anesthesiologist will discuss with you. All patient rooms have a bed for a parent to spend the night.

If you are transported to the intensive care unit, your parent(s)/guardian(s) will be brought back to the room first to speak with the medical staff. Other family members may visit after your parents have spoken with the staff. Siblings can visit. Other visitors need to be at least 12 years old. In the intensive care unit there is a family lounge, kitchen, shower and laundry facilities for family use. There is also a meditation room available.

## **frequently asked questions**

### **How big will my scar be?**

The incision will be approximately 10-14 cm.

### **Will the metal from the device cause any harm to my body?**

The device does not cause any harm to the body.

### **Will the device have to be removed?**

No. There is usually no need to have it removed.

### **Will I be able to feel the device when I move?**

Very thin people sometimes feel the device if someone pushes on the skin. Otherwise, you shouldn't feel it.

### **Will I be able to sleep on my back again?**

Yes, at any time. You will be comfortable in this position.

### **Will I be able to bend from side to side?**

Yes. You will not have any problems bending side to side.

### **Can I still take part in exercise/dance?**

Yes. Most children and teens can play sports with no limitation. This includes sports such as gymnastics, which requires a high level of flexibility.

### **How long will I be in surgery?**

The surgery, including anesthesia set-up, positioning and post-surgery time takes around two to three hours.

## **How long will I be in the hospital?**

Most patients are in the hospital between 24-48 hours. Once you are able to walk on your own, eat regular food, have little to no drainage from your surgery site and have your pain controlled, you will get to go home.

## **what should I expect the first days**

The first night, nurses will continually check your blood pressure, heart rate and breathing. You will be fairly sleepy after surgery. You will be given intravenous (IV) fluids. You will start out with a clear liquid diet and then move to solid foods as you can handle them. You will be out of bed to the chair and walking the night of surgery.

The acute pain service (anesthesiologists and advanced practice providers) will be working with you and your surgeon to manage your pain. Please let us know of any questions or concerns.

You will receive different pain medications. These medications all work in different ways in your body to control pain. Together, they will keep you as comfortable as possible. We will make changes as needed throughout your stay.

You will have an IV opioid pain medication available upon request. You will also receive other IV medications given by your nurses. When you receive these IV medications, they should work quickly to help your pain. They do not last as long as oral (given by mouth) medications, so as soon as you start tolerating solid food the first night, we start to change your medications to oral ones. They last longer and actually work better than the IV medications. While you are on all these medications, you will be connected to a monitor to evaluate your heart rate and breathing. The information from the monitor helps us to deliver the medications safely.

## **Medications given:**

- Dilaudid (opioid) to be available via IV upon request.
- Methadone (long lasting opioid)
- Tylenol
- Toradol, Ibuprofen (non-steroidal anti-inflammatory drugs)
- Robaxin, valium (muscle relaxers)
- Zofran (nausea)
- Oxycodone (opioid)
- Gabapentin (nerve pain medication)
- Senna, miralax and relistor (bowel movement medication)

## **Will I need a hospital bed at home?**

No.

**Will I have any limits with contact sports?**

After the first three months after surgery, there will be no limits on contact sports (talk with your surgeon first)

**Will I have to wear a brace after surgery?**

No.

**Could I develop arthritis in my back later in life?**

The chances of developing arthritis are very high if scoliosis is left untreated. However, after surgery, the chances of developing arthritis returns to a normal risk level.

**Will I get taller?**

More than likely, about an inch or two.

**How soon after surgery can I walk?**

You will be able to get out of bed to a chair and walk around the night of surgery.

**What are the chances of paralysis due to operating so close to the spinal cord?**

The risk is low in most children, less than 1%. Your doctor will tell you if your chances are greater based on your condition. Other complications may occur. Please see risks and complications of surgery section.

**Will I have to do wound care when I get home?**

Usually very little wound care is needed. Most wounds are closed with stitches under the skin.

**Will this diagnosis and surgery affect me if I want to have children as an adult?**

No, it does not affect your ability to have children but in females, depending on where the fusion is, it may limit the ability to have an epidural placed during labor.

**Will my future children have scoliosis?**

Your children will have a greater chance of having scoliosis.

**If you have other questions, please call our spine nurse navigator, Jenna Keiffer, BSN, RN, CCRN, at 937-641-5323.**

# surgery

## what should I do the day before surgery?

- Use the Chlorohexidine wash provided to you at your pre-op teaching appointment to shower the night before surgery. This will be the last thing you do before getting out of the shower. Bathe or shower the evening before surgery with your normal body wash/shampoo. Be sure to wash your hair. After your normal shower is completed, use a clean washcloth to apply the chlorohexidine wash from your neck to hips and thighs to feet. Be sure to pay extra attention to your back. Do not use on private areas or face.
- Do not put on any lotion or deodorants after shower is completed or the morning of surgery. They can make it hard for tape to stick to the skin correctly and can increase the risk of infection.
- Sleep in clean pajamas.
- Remove any jewelry, including all piercings.
- Remove any nail polish. An oxygen saturation monitor will be placed on your finger during surgery. The monitor shines through the nail bed to measure how much oxygen is in your blood. This can be hard to read if your nails are painted.
- Do not wear makeup the day of surgery.
- Put long hair up with a nonmetal hair ponytail holder.

**NOTE:** Please part your hair in the middle from front to back and fix the hair in pigtailed that start behind each ear. Secure them with a hair fastener that does not have any metal in it. Your hair should be clean and dry with no hair products in it.

- Remove contact lenses and bring eyeglasses.
- If applicable, remove any removable mouth appliances (like retainers).
- Do not take any aspirin, ibuprofen (like Aleve, Advil or Motrin) two weeks before surgery.
- If you are old enough to smoke, drink alcohol, or vape, do not do so for two weeks before surgery. We also recommend that you quit smoking to protect your health.

### bowel regimen

Spine surgery can cause a lot of constipation due to the surgery, anesthesia, being less mobile and pain medications. It is important to work on softening your stool before surgery so we can help reduce the risk of constipation after surgery.

- Take 1 capful of MiraLAX (polyethylene glycol-over the counter) daily for two days prior to surgery.
- Take 1 tablet of Colace (docusate sodium-over the counter) twice a day for two days prior to surgery.



### **don't eat**

Do not eat solid foods (including candy, chocolate or chewing gum) or drink any liquids after midnight or as instructed by preoperative staff. They will call you a day or two before surgery to give you specific times.

### **what to pack**

You can expect to stay in the hospital for 24-48 hours on average. Please label all items that you are bringing with you.

- Personal care items.
- Laptop or tablet, cell phone, phone charger, books, cards, crafts and music.
- A body pillow to help you get comfortable in bed and help with positioning.
- Fitted undershirts to wear over or under your brace if a brace is needed.
- Schoolwork.
- Robe, slippers and pajamas. If a parent is spending the night, they should bring clothes that can be layered for temperature changes.
- Tennis shoes for walking.

## **what to bring with you the day of surgery**

- Health insurance card and photo identification.
- Health insurance co-payment.
- Medicines that you take including inhalers, vitamins, herbals and over-the-counter drugs in their original containers.
- If you are bringing your contact lenses, bring contact lens solution, contact lens case and eyeglasses.
- If you are bringing removable mouth appliances such as retainers, bring the appliance case.
- If you are 18 years old or older, bring a copy of your living will or advance directives.

## **other helpful tips from parents whose children had scoliosis surgery**

- Develop a relationship with your child's nurses.
- Sleeping in the hospital will be difficult. Nurses are in and out of your child's room checking on your child and giving medications.
- Divide duties with other family members. Ask them to sit with your child so you can get a meal. If a family member or friend can't sit with your child, ask to have a volunteer sit with your child so you can take a break.
- The Ronald McDonald Family Room offers parents, grandparents and siblings a quiet place to have a break, take a shower or do laundry. The Family Room also has coffee, snacks and lite meal options. Ask your nurse for directions.

# during surgery and the first 24 hours after

During surgery, your family can wait in the surgery waiting area on the second floor. After surgery, you will be in recovery for one to two hours. When you arrive to the hospital on the day of surgery, ask the surgery desk for a key to the private waiting room.

## **note to parents/guardians:**

After you are updated by the surgeon, you can plan to see your child within the next two hours. Visitors will need to rotate two at a time. Our goal is to let your child rest and closely monitor them the first night.

When you first see your child after surgery, your child will be connected to many monitors. Your child may require extra oxygen or have assistance breathing with a ventilator. Typically, the child's face is puffy from positioning during surgery and they will be drowsy. This will also be covered in the pre-surgery teaching.

If your child is in the intensive care unit (ICU), their vital signs will be checked every hour until the following morning and then every two hours. In the intensive care unit, patients are checked more frequently due to a higher acuity.

If your child is in the ICU they will be transferred to the orthopedic surgery floor when your child's doctor decides it is okay. Assessments and vital signs don't need to be monitored as often as patients who are in intensive care. In addition, there are fewer visitor restrictions in the orthopedic unit.

## **incentive spirometer**

You will be taught during the pre-surgery teaching how to use an incentive spirometer. Using this after surgery will help you keep your lungs clear. By using the incentive spirometer, secretions will move out of your lungs. This will help prevent a fever. If you are watching television in bed, we suggest using the incentive spirometer every time a commercial comes on.

## **logrolling**

Logrolling is a way to change positions in your bed while you're on bed rest. The nurses will do logrolling until you can move on your own. Your body is moved at the same time to avoid bending, twisting and straining of your spine. The head, middle of your body and feet should form an imaginary line as you're rolled to your side. While rolling, your head, middle of your body and legs are supported.

You may feel a little dizzy or lightheaded the first time you sit up. You should sit up slowly, keeping your eyes open and take a few slow, deep breaths. The physical therapist will work with you to help you progress to standing, sitting out of bed in a chair and walking.

## pain team

Our pediatric acute pain team treats patients with a multi-modal approach to acute post-surgery pain. Treatment is tailored to each child's individual needs based on a spinal surgery pain protocol developed by the acute pain service. Team members include board-certified pediatric anesthesiologists and advanced practice providers. Our goal is to make you as comfortable as possible. You will still have some pain with a pain level goal of 3-4 out of 10. It is important to still get out of bed and walk around even with pain to help you heal and help to avoid complications.

## visits from a child life specialist

A child life specialist may visit you during your hospital stay. Child life specialists are members of the health care team who focus on the emotional and developmental needs of teens and children. Child life specialists provide support to the patient and families to help them cope with illness, injury and treatment.

### the child life department supports the patient and families by providing:

- Preparation: The child life specialist helps patients get ready for upcoming procedures through books, medical play and hospital tours.
- Coping and support: A child life specialist may go with a patient to their medical test or procedure and offer support and help take their mind off of the test or procedure. This may include deep breathing, visualization and focusing on age appropriate distraction toys. It may be helpful to bring a device to listen to your favorite music to relax.
- Activities: The child life department provides activities and crafts for all ages in the activity center or at bedside for those unable to visit the activity center. Board games, books and magazines are available through the child life department.
- Dayton Children's has guest wireless internet available for patient and family use. Access it by clicking "Dayton Children's Guest Network" in your wifi settings. No password required.

## what to expect after surgery

If you require medical equipment and/or a wheelchair prior to surgery you will still need medical equipment after surgery. If you walked prior to surgery, you should be able to walk short distances by the time you leave the hospital, and climb up and down the stairs. Slowly your strength and endurance will get better and your pain will lessen. This takes time, so you will need to rest as much as you can while you are at home. Some days will be better than others while you're recovering.

### dressing/incision

You will keep your dressing on for one week after surgery. After those first seven days, you may remove your outer dressing (Tegaderm and Covaderm). This is the clear dressing and the white padded dressing. We close the inside of the incision with dissolvable sutures then close the outside of the incision with a surgical glue (Dermabond). There will be a mesh dressing directly on the incision. This glue and mesh dressing will stay on the incision until you follow up with the surgeon. If this mesh dressing begins to come loose, you may cut the loose parts but do not pull off the mesh dressing.

If drainage develops after you go home from surgery, please call the Spine Nurse Navigator at 937-641-5323.

Please watch for signs and symptoms of infection with the wound. These include excessive drainage, redness, fever, vomiting, and the wound being warm to the touch. If any of these develop, please call the Spine Nurse Navigator.

Do not put any creams or lotions on the incision until it is fully healed (around two to four weeks after surgery)

## **pain**

You may feel some unusual twinges of pain in the muscles of your back, particularly in the shoulder region. If the pain medication that is prescribed to you is not decreasing your pain level or your pain is really bad, sudden or persistent, please call our spine nurse navigator at 937-641-5323.

## **numbness**

You can expect some numbness around the incision area for several months after surgery. This is due to stretching of the skin at the time of surgery and does not suggest any type of permanent nerve injury. Sometimes, despite padding, you may have pain or numbness in the outside of your thigh. This may last for a few months.

## **scarring**

Your incision will be thin, but the healing process causes the scar to become red and raised up for a few months after surgery. After one year, the scar should be soft, bendable and healed. At this time, the scar is mature. There may be some spreading of the scar tissue as it matures, but this varies from patient to patient. Stay away from sunlight for at least two weeks before surgery. From 3-12 months after surgery, it is important to wear heavy sunscreen on the incision if it is exposed to keep it from turning purple permanently. If you experience any drainage from your scar after surgery, please contact our office immediately at 937-641-5323.

## **diet**

You can start drinking clear liquids after surgery. Food will be added slowly as tolerated.

## **bathing**

You will bathe by using a washcloth in the bed until you are able to get up and walk around. Once you are up and moving, you can shower with help. You can safely shower anytime after surgery as you are able to allow water to run over the incision and then pat dry. Your dressing has a clear outer dressing on it that will keep the wound dry. Do not scrub the incision. You may not swim in a pool or soak in a bath tub until your wound is fully closed (usually around two to four weeks after surgery). We will discuss this further during your pre-op teaching appointment. Once your dressing is removed you will still be able to shower in the same manner.

## **activity restrictions**

You will be able to walk and move around in bed immediately. The nurses will work with you to walk often to avoid complications. Small walks as tolerated are okay to do after surgery when you go home. Limit bending and twisting until you follow up with the surgeon. No lifting more than 20 pounds for the first four weeks. The surgeon will guide you as to when it is okay to advance your activity level.

# physical therapy after surgery

## after surgery

Our physical therapy team is here to help you learn how to safely move in bed, transfer from bed to standing and walk short distances as your strength gradually returns.

Each patient is unique in how quickly they heal and resume activity; physical therapy works closely with your surgeon and nursing staff to develop a program that is tailored to your individual needs.

We will slowly increase your activity each day as we build strength and endurance. Movement is important to help with blood flow, lung function, digestion and healing. We strive to make sure you are independent with your home program and your family knows how to best assist you at home prior to discharge.

## post-surgical rehab

Your surgeon may recommend additional physical therapy beginning 2-4 weeks following surgery to help you regain mobility and strength. We offer an unique approach to improving core strength and stamina through our Scolio-Pilates® program. Dayton Children's Hospital has four locations throughout the Miami Valley staffed with specialized equipment and physical therapists who are highly trained and experienced in treating patients who have scoliosis.



# home care

## going home

By the time of discharge, most patients do not have any significant pain. Pain is usually described as aching and is mostly along the incision.

Upon discharge, you will be given prescriptions to take the following oral medications:

1. Tylenol
2. Ibuprofen
3. An opioid for 5-7 days
4. A muscle relaxer

We may add a few oral medications for nausea, increased muscle spasms and/or increased nerve pain. You will also be given medications to help you have a bowel movement (poop).

Please contact our spine nurse navigator, Jenna Keiffer, at 937-641-5323 after discharge if you are having continued problems with pain management, constipation or nausea.

## 5-10 days

### Permitted activities include:

- Sitting or standing. It is important to have a family member available to help you. It is normal to feel somewhat weak after any major surgery. You will get tired easily.
- Walking with gradually increased distances.
- Shower as instructed.
- Go up and down stairs with help.
- You can carry weight up to 20 pounds.
- Take daily vitamins with iron.
- Do not push yourself too hard. Remember you just had a major surgery.

### Check for signs of infection for 2 weeks

For the first two weeks after your dressing is removed, your incision should be checked every day for any changes.

**The entire incision should look the same from top to bottom:**

- The edges of the incision should be closed with no openings or holes.
- There should be no drainage, pimples or pustules.
- The wound area should be pink in color, but not red.
- If the incision looks different or if there are changes, please call our spine nurse navigator, Jenna Keiffer, at 937-641-5323

## **around 2-4 weeks:**

You will have your post-surgery check-up on \_\_\_\_\_

## **2-3 weeks:**

**Permitted activities include:**

- If you feel well enough, you may go back to school around 2 weeks after surgery. You must be off all narcotic pain medications and be able to sit safely in the classroom and be safe to use your transportation to and from school. You may start online education when you are able to safely sit in a chair and participate at any point after surgery.
- Each child responds differently to surgery. Some patients return to school starting with half days and progress to full days as tolerated.
- You will follow up with your surgeon at this time. Likely you will be able to begin in some light jogging and stationary sports.
- Riding a bicycle.
- Swimming and swim play (no diving or jumping from the side of the pool)
- You will begin physical therapy at this time.
- You can carry school books that weigh no more than 20 pounds.
- Short road trips, such as visiting friends or going to church are permitted. If you are taking a long road trip, please take 10 to 15 minute rest periods to walk and stretch after every hour of traveling. (A healing back gets tired easily with long periods of sitting).

## **4-6 weeks**

**Permitted activities include:**

- Non-contact sports
- Running and jumping
- Resume weight lifting with a maximum of 20 pounds and back support-supportive curls, quadriceps curls and quadriceps strengthening, only low weight reps. (No dead lifts, twisting or jerking exercises).

## 2-3 months:

### Permitted activities include:

- Contact sports once cleared by physician
- Diving from the side of the pool
- Most restrictions are lifted at this time. Please talk with your doctor about activities where high velocity/high speed falls are likely, such as water skiing, downhill skiing, horseback riding, bungee jumping and parachuting.
- Attend full gym class at school.
- You may participate in amusement or water park activities three months after surgery.

## why should you exercise after surgery?

- It will help you get your appetite back.
- It might help you sleep soundly.
- It will improve your balance.
- It will promote healing.

## is there any time that I should call my doctor?

- Drainage from the incision site.
- Increased redness, swelling or opening of the incision site.
- Numbness, tingling or weakness in the legs.
- Fever.
- Any increase in pain.
- Any bowel or bladder incontinence.
- Any other concerns or questions regarding care.

**You will probably see the doctor for a recheck at two to four weeks, two months, six months, and 12 months after surgery and yearly after that.**

The information included in this handbook is for general information only and should not be considered complete. For specific information about home care after scoliosis surgery, please ask your doctor.



# success stories



## Victoria Hernandez

from the windy city to the gem city for spine surgery

At the end of September 2020, Victoria Hernandez's parents, José and Lidia, noticed that one of the 12-year-old's shoulders was higher than the other. When they asked her about it, she mentioned that she had been experiencing some pressure in her back, but she thought it was normal.

They consulted with a pediatric orthopedist in their hometown of Chicago. The physician took an X-ray of Victoria's back and determined she had scoliosis. During their appointment he gave them a few options for next steps which included the use of a brace, spinal fusion surgery or a new spinal procedure called ApiFix, a minimally invasive procedure that was recently approved by the Food and Drug Administration.

ApiFix offers substantial benefits over a traditional fusion surgery to straighten a curved spine, including a smaller incision, faster operation and shorter hospital stay. It acts as an internal brace and naturally expands as the child grows or exercises.

Victoria and her parents knew right away that they did not want to pursue the spinal fusion surgery. One of Victoria's cousins had recently had the surgery and his recovery had been long and difficult. Instead, they started scouring the internet looking for hospitals that performed the ApiFix procedure. During their search they found Dayton Children's Hospital. And, after reading through the website and doing additional research, they made an appointment with Michael Albert, MD, chief, division of pediatric orthopedics.

*continued on next page*

The Chicago-based family traveled to Dayton in December to determine if Victoria would be a candidate for ApiFix. At the appointment, Dr. Albert took another set of X-rays of Victoria's back and found that the curve of her spine was at 51 degrees, which confirmed that she had severe scoliosis and would be eligible for ApiFix. Her surgery was scheduled for a month later.

"When we met with Dr. Albert, he gave us a lot of time and answered all of our questions," said José. "We never felt rushed. We had confidence in him based on our appointment and what he had done for other kids, like Victoria."

The Hernandez family returned to Dayton for Victoria's surgery on January 28, 2021. The surgery itself took just over one hour and required only three anchor points or screws. Once in her hospital room, Victoria was up and walking, with the assistance of a nurse, in under an hour. She stayed just one night in the hospital and only needed Tylenol or Advil to manage any pain she was experiencing after being discharged.

Her parents say that Victoria was singing and dancing while watching the Super Bowl just 10 days after surgery. And, she was ready to return to school within two weeks. She continues to do exercises at home and will start rehab in a few weeks, but her dad says, "you would never know she has scoliosis."

For patients and families considering ApiFix, he says, "Do it. The surgery was like magic. It's a much less complicated surgery than a spinal fusion, more effective than a brace, and you can see the correction right away. With ApiFix, you leave your child with the surgeon for a few hours, and they return with a new back."



## Breana Gard

### new spine surgery gives Breana her life back

Breana, 16, has been a patient of Michael Albert, MD, chief, division of orthopedics at Dayton Children's for the last four years following a scoliosis screening at school.

She slept with a back brace for nearly three years, but it wasn't giving her the results she needed. Due to her growth, the curve in Breana's back had increased from 25-degrees to nearly 50-degrees in a matter of a few years. While she was not in any pain, as an adult, she would have major health complications if the curve was not corrected. Dr. Albert determined that the next step would be for Breana to have surgery.

While the traditional treatment for scoliosis is spinal fusion surgery, Dr. Albert suggested ApiFix, a new, minimally invasive procedure that was recently approved by the Food and Drug Administration. ApiFix offers substantial benefits over a traditional fusion surgery to straighten a curved spine, including a smaller incision, faster operation and shorter hospital stay. It acts as an internal brace and naturally expands as the child grows or exercises.

"We are thrilled to offer the ApiFix system to our scoliosis patients," said Dr. Albert. "This new approach will allow kids to have a faster recovery and less pain than traditional treatment for scoliosis—with recovery being measured in days, not months."

Dr. Albert believed that Breana would be the perfect candidate for this new surgery. He presented Breana's case to the ApiFix team and was approved. She would be the first patient at Dayton Children's to benefit from this procedure.

"We were naturally apprehensive about our daughter needing surgery," said Breana's dad, Jim. "But, Dr. Albert won us over with the information he gave us, his confidence level and his belief that she was a good candidate for the procedure. Plus, the surgery was minimally invasive, compared to spinal fusion surgery, and she was likely to have positive results."

Breana had her two-hour ApiFix surgery with Dr. Albert and Alvin Jones, MD on November 12. She was able to go home just 24-hours after surgery and required prescription pain medication for only four days. Breana was back at school two weeks after surgery and she recently started going to physical therapy twice a week to work on her flexibility.

Her parents are amazed by Breana's progress and how fast she has recovered from surgery.

"It takes a lot of courage for your child to be a surgeon's first, but the rewards are endless when you know how many others will benefit from the procedure in the future!" said Wende, Breana's mom.





## preparing for surgery

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## spine medication chart

| medication | dose | frequency | when the next dose is due | other information |
|------------|------|-----------|---------------------------|-------------------|
| Tylenol    |      |           |                           |                   |
| Ibuprofen  |      |           |                           |                   |
| Robaxin    |      |           |                           |                   |
| Oxycodone  |      |           |                           |                   |
|            |      |           |                           |                   |
|            |      |           |                           |                   |
|            |      |           |                           |                   |
|            |      |           |                           |                   |
|            |      |           |                           |                   |



# glossary

**Acuity:** Acuity is the level at which your child needs close monitoring, particularly after coming out of surgery and being under anesthetics.

**Anesthesiologist:** An anesthesiologist uses medicine to manage pain and help your child sleep during surgery. Their goal is to help ensure your child's safety and comfort. Our anesthesiologists are specially trained to care for children.

**Back brace:** Something patients wear that acts as a holding tool that keeps the spine from forming more of a curve.

**Chiropractic manipulation:** Specific to the spine, a chiropractic manipulation is when the doctor uses their hands or a tool to apply sudden pressure to a spinal joint that can provide immediate pain relief.

**Dressing:** Gauze or cloths that are used around the incision to help protect the skin around it from irritation/skin breakdown.

**Incentive spirometer:** Device used to help your breathing improve after surgery.

**Incision:** Cuts made by the surgeon during your child's surgery.

**Musculoskeletal system:** The combination of the muscular and skeletal systems working together and includes the bones, muscles, tendons and ligaments of the body.

**Nurse practitioner:** A nurse practitioner is a nurse that has advanced training. A nurse practitioner is part of your child's care team and works together with the surgeon, anesthesiologist and physical therapist.

**Orthopedic specialist:** An orthopedic specialist is a doctor that is specifically trained in treating orthopedic conditions such as the spine.

**Pediatric surgeon:** A pediatric surgeon is a doctor with extra training in treating patients by doing surgery and specializes in children. Your surgeon is part of your child's care team, and meets with you before surgery to explain everything and answer questions. You will also have follow-up visits with your surgeon after surgery.

**Physical therapist:** A physical therapist is specialized in helping your child reduce pain and improve or restore mobility after surgery. The physical therapist is part of your child's care team and works together with other members of the care team.

**Scoliosis:** A condition that causes the spine to curve from side to side, like an "S".

**Secretions:** Secretions is something that is produced by your body such as mucus in your lungs.

**Vital signs:** Vital signs are things that your nurse will check frequently during and after surgery. Vital signs include pulse rate, respiration rate, temperature and blood pressure.

