

A guide for patients
and families

What to Expect: Conservative Scoliosis Care



AMAZING
THINGS
ARE
HAPPENING
HERE

for Kids

Division of Pediatric Orthopedics

NewYork-Presbyterian/Morgan Stanley Children's Hospital
Columbia University Medical Center

Department of Orthopedic Surgery

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columbiaortho.org



COLUMBIA UNIVERSITY
DEPARTMENT OF ORTHOPEDIC SURGERY
College of Physicians and Surgeons



NewYork-Presbyterian
Morgan Stanley Children's Hospital

Welcome to Columbia Orthopedics

Dear Parents & Patients,

Welcome to the Center for Conservative Spine & Scoliosis Care at Columbia Orthopedics. We understand that scoliosis can be a frightening diagnosis and that you will have many questions. We have designed this book to provide you with general information about scoliosis and the non-operative treatment options available to you at Columbia.

Here at Columbia Orthopedics we have assembled a group of scoliosis experts who work together with families to create an individualized care plan for every patient. We do this by offering the most up-to-date, safest, and effective treatment options, as well as the support and guidance of our specialists.

Columbia Orthopedics is dedicated to providing sensitive, age-appropriate care to children and their families throughout their scoliosis journey. We understand that the emotional impact of scoliosis can be as intense as the physical demands and we are here to support you.

Sincerely,

The Conservative Care Team at Columbia Orthopedics

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Your Conservative Care Team



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David P. Roye, MD



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Benjamin D. Roye, MD



Jennifer Hope, CPNP



Amber Mizerik, PA



Nikki Bainton, CPNP



John Tunney, BOCPO



Hagit Berdishevsky, DPT



Prachi Bakarania, DPT



Kelly Grimes, DPT

Contact Information

Online Messaging – Patient Portal:

You can send messages to the clinical staff and office via the patient portal. At your next visit please ask for an invite to the patient portal so that you can sign up. You cannot sign up online without an invitation so please make sure to fill out the appropriate paperwork at your office visit. Patients older than 12 must sign up with their own email address and then make the parents their proxy.

Clinical Questions:

You may reach a member of our clinical team by calling **(212) 305-5475**. Please leave a detailed message with the team member who answers your call so that we might direct you to the most appropriate clinician. For school notes, PT prescriptions and x-ray requisition requests: please have a fax number or address available.

General Information

Medical Records

You may access health information we maintain about you or your child. You must complete a release form giving us permission to share protected health information with other providers. Please contact our medical records office so that they can help you with your requests. Their number is **212-305-0099**. You can also visit our website at columbiaortho.org/patients/medical-record-information to obtain the form online.

Insurance & Financial Information

Columbia Orthopedics has partnered with East Coast Orthotics to provide our patients with braces. If you have a question about insurance authorization or coverage of a **brace**, please contact Angela Berberich at **(631) 392-2237**.

Billing questions regarding an appointment with one of our providers should be directed to the Columbia Orthopedics Billing Department at **(646) 317-7111**.

Our Websites

Pediatric Orthopedics: columbiaortho.org/specialties/peds

New York Presbyterian/Morgan Stanley Children's Hospital: childrensnyp.org

Team Approach to Conservative Scoliosis Care

Conservative Care is an approach to the treatment of scoliosis focused on avoiding surgery. Currently, the conservative methods that we use to treat scoliosis non-operatively are bracing and Scoliosis Specific Exercises. Both of these options require an intense and prolonged commitment from the child and family, as well as a skilled team of orthopedic providers, orthotists, and physical therapists.

The study “Effects of Bracing in Adolescents with Idiopathic Scoliosis,” published by The New England Journal of Medicine in 2013, found that among patients with curves ranging from 20 to 40 degrees, bracing was more effective than observation at preventing progression to surgery. It also found that the number of hours that the child wears the brace matters – patients who wore the brace more had a greater likelihood of avoiding surgery. However, we know that handing a teenager a brace and telling them to wear it is not effective without the support of family and a team of trained professionals.

We understand that the diagnosis of scoliosis affects the entire family and we are committed to supporting and empowering you throughout this process. Our team includes doctors, nurse practitioners, physician assistants, orthotists, and physical therapists. Each team member brings a unique set of strengths and skills to the treatment process, and by working cooperatively we address all aspects of your care.

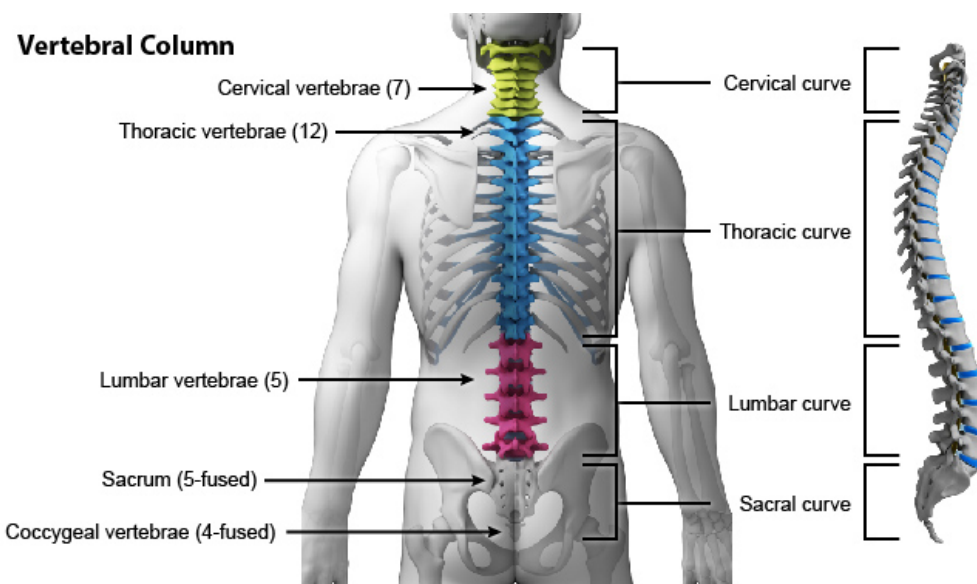
What is Scoliosis

Scoliosis is a 3-dimensional curvature of the spine. The most common form of Scoliosis is called Adolescent Idiopathic Scoliosis (AIS) – it is first diagnosed between ages 10 and 18. The term 'Idiopathic' means that the cause is unknown, and denotes that this type of scoliosis is not caused by any other medical problem. Scoliosis can also occur in children younger than age 10, and this is referred to as Early Onset Scoliosis (EOS).

AIS affects as many as 4 in 100 children and is more common in girls. There does appear to be a genetic link to AIS as the incidence is greater in children with a family history of scoliosis in a close relative. This book will be discussing AIS but many of the same principles and treatments apply to younger patients as well.

Anatomy of the spine

The spine is made up of 24 mobile vertebrae: 7 cervical, 12 thoracic, and 5 lumbar. The cervical vertebrae compose the neck, the thoracic vertebrae are attached to the ribs, and the lumbar vertebrae are in the lower back. The 5th lumbar vertebra connects to the sacrum, which is in turn attached to the pelvis. The spine houses and protects the spinal cord. When viewed from behind the spine should be straight and when viewed from the side it should have a normal thoracic *kyphosis*, or forward curvature, and a lumbar *lordosis*, or backwards curvature.

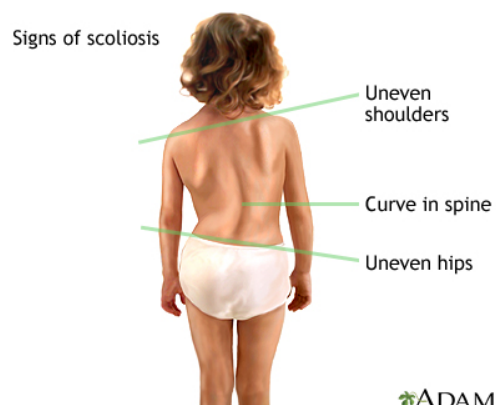


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¹ Image: cybersurgeons.net

Connection to growth

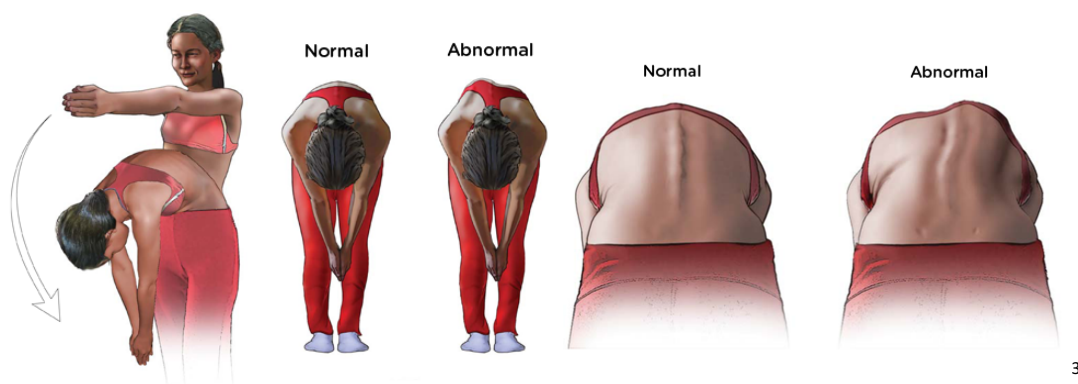
Most children with scoliosis are not aware that they have it. Usually, a difference in the child's back is first noticed by parents or by a medical professional during a routine physical exam. The child may have passed routine scoliosis screenings in the past, but then an asymmetry appears in the child's shoulders, scapula, ribs or hips over a short period of time. This is because *scoliosis tends to progress as a child goes through a growth spurt*. Likewise, scoliosis tends to stabilize once a child is finished growing.²



How is scoliosis diagnosed?

The pediatrician uses the forward bend test to evaluate differences in the trunk. If there is a concern about scoliosis, your provider will send you to an Orthopedist for a spine x-ray and further clinical evaluation.

The forward bend test



The Orthopedist orders an x-ray of the spine and determines the degree of the scoliosis by measuring the curvature. This is referred to as the **Cobb angle**. Curves less than 10 degrees are considered within normal range, 10 to 25 degrees is a mild scoliosis, 25 to 45 degrees is a moderate curve size, and greater than 45 degrees is severe scoliosis.

Is that an 'S' or a 'C' curve?

There are a variety of curve patterns found among people with scoliosis. Some people have one curve; others may have two, three, or even four curves. Having more curves does not mean that your scoliosis is worse. The body wants to maintain balance by keeping your head centered over your pelvis. It does this by creating additional *compensatory curves*. These curves are a normal and expected finding.

² Image: www.nlm.nih.gov

³ Image: www.choa.org

Why do we treat scoliosis?

In and of itself, a scoliosis measuring less than 45 degrees in a fully-grown person *does not have any impact on overall health or functional abilities*. The size of these curves tends to stay stable throughout life. However, once a curve is 45 degrees or larger it may continue to get bigger even after a person is completely grown. Very large curves can begin to impact internal organs such as the lungs, and they may cause back pain and functional difficulties.

The goal of treating adolescent idiopathic scoliosis is to prevent progression once treatment is initiated and help the child arrive at skeletal maturity with a curve less than 40 degrees.

When curves become greater than 50 degrees there is a very high likelihood that they will continue to get larger over time. At this point, spinal fusion surgery is recommended to correct the scoliosis and halt progression of the curve.

Calcium and Vitamin D Supplementation

Recent research suggests that Calcium and Vitamin D supplementation may further reduce the risk of progression of adolescent idiopathic scoliosis. We recommend that you take **600 mg of Calcium** and **800 IU of Vitamin D3 daily**. Many pharmacy chains carry this dose of calcium and vitamin D in one pill. This is a common over the counter supplement and does not require a prescription.

How will scoliosis affect my life?

Being told that you have scoliosis can be scary. In all of the most important ways scoliosis will not change who you are. Your personality will be the same, you will not feel sick or unhealthy, and you can still do all of the sports and activities that you enjoy.

However, while you are still growing your scoliosis needs to be checked by your Orthopedist several times per year. You will most likely need to get x-rays taken at your appointments to make sure that the curve hasn't progressed. Depending on the size of your curve, we may recommend a special type of physical therapy or you may be prescribed a back brace to wear. Living with a brace can be challenging, but this is temporary – *once you are finished growing you will be finished with the brace*.

As an adult, scoliosis will not stop you from doing any of the things you love. You will be able to have an active life, participate in sports without restriction, and have children.

Orthopedic Appointments and Imaging

Once you have been told you have scoliosis your Orthopedist will want to see you several times per year. The number of visits will vary based upon how quickly you are growing and the treatment regimen we have developed. In general, you can expect to see us 2 or 3 times per year. At those visits you will be asked to change into a gown so that we can perform a physical exam, which includes looking at your back during the forward bend test.

Spine X-rays

At most visits your Orthopedist will ask you to get a spine x-ray prior to your appointment. We do this in order to compare Cobb angle measurements and track your curve over time. X-rays may also be used to check the fit and effectiveness of a brace. Many children and parents have concerns about the repeated exposure to radiation at such a young age. We take this concern very seriously and do our best to limit the number of x-rays per year.

EOS

We have installed an extremely low-dose x-ray machine, called **EOS**, at our Morgan Stanley Children's Hospital location. This machine simultaneously captures a full body image from the front and side and then uses a computer to combine the images. This unique process cuts the radiation exposure. As an added benefit, this type of x-ray is much faster; it takes less than a minute to complete. *In order to use EOS the patient must be able to follow directions and stand completely still for about 20 seconds.*⁴



Why a hand x-ray?

A large part of treating scoliosis appropriately is determining the child's current rate of growth. To do this we consider several factors: any recent increase in height, pubertal development, and a special x-ray of your hand called a *bone age x-ray*. This x-ray helps us to determine where you are in your growth: whether you are growing steadily as a pre-adolescent, in the midst of your adolescent growth spurt, or in the slower final stages of growth. This information will help guide our treatment decisions. Unfortunately, it does not tell us how tall you will be!

⁴ Image: www.eos-imaging.com

Why a hand x-ray? *(continued)*

There are many bones in the hand and each one of these bones has a growth plate that we can see on x-ray. As a child matures, these growth plates begin to close in a sequential manner beginning at the tips of the fingers and proceeding down the hand until, finally, the growth plates of the wrist close. At that point the child is finished with growth. We use a grading system called the *Sanders scale* to classify the x-ray into one of 8 stages. *The adolescent rapid growth spurt occurs during stages 3 and 4*, followed by a period of slower growth. Understanding where you are in your growth tells us when to initiate and end treatment and helps guide us on how frequently you need to follow up.

MRI

Not all scoliosis is AIS; sometimes there are other reasons that scoliosis develops. If your Orthopedist notices that the curve has an atypical pattern, if the curve is progressing rapidly or if there are differences in your neurological exam we may ask you to get an MRI of the spine. This test allows us to look closely at the spinal cord to make sure that it is not being affected by the scoliosis and that there are no other causes of the scoliosis. This test is non-invasive and takes about one hour; it only requires that you lie still on a table inside the MRI machine.

We understand that lying still can sometimes be difficult for children, so at Morgan Stanley Children's Hospital we have Child Life Specialists on staff to explain the test in a developmentally appropriate way. There is a special "mock" MRI machine, which the Child Life Specialists may use to allow children to simulate the experience through play. This helps them to prepare for the test and understand what is going to happen. We also have special glasses and headphones that can be worn in the MRI machine to watch movies or listen to music. If you are interested in any of these options, please let your provider know and we will connect you with Child Life.

Research and technology

As a major academic institution, Columbia University is dedicated to enhancing the existing body of knowledge about scoliosis through research and the development of new technologies. At a visit with your Orthopedist you may be asked to participate in a research study. Your involvement may include filling out a questionnaire, allowing us to take your measurements, or trialing a new app or device. While the choice to participate is always optional, we hope that you will seriously consider any research request because the information we collect improves the care of all patients with scoliosis. All research at the University is under the strict oversight of the Institutional Review Board and whether or not you choose to participate in a study, your care will always adhere to standard practices.

Bracing

Bracing treatment is typically recommended after the curve has reached 25 degrees, but this may vary depending on the child's age, skeletal maturity, family history and additional factors. Several types of braces exist, such as the Boston style TLSO (thoracic-lumbar-sacral orthosis) brace, Charleston bending brace, Providence brace, and a Rigo-Chêneau brace.

All braces are designed to prevent progression of the spinal curve. However, it is expected that when you take off the brace your spine will return to its previous shape. Bracing does not cure or improve scoliosis.

It is important to remember that our goal is to keep your curve from changing, even though you are growing.

Advances in brace design have allowed for more comfortably fitting braces. If your brace is uncomfortable, it is important to speak with your Orthopedist as well as your orthotist. They may want to take updated x-rays to see if the curve has progressed; evaluate whether you have outgrown the brace; or make changes to the brace. If the brace is comfortable then you are more likely to wear it for the recommended number of hours.

Types of braces

In our practice, we typically use the Boston TLSO and the Rigo-Chêneau brace. The Boston TLSO utilizes a custom, made-to-measure design. It works by applying three-point pressure to the curvature via foam pads placed within a molded plastic shell. The brace is constructed using a radiograph-based blueprint designed by the orthotist.



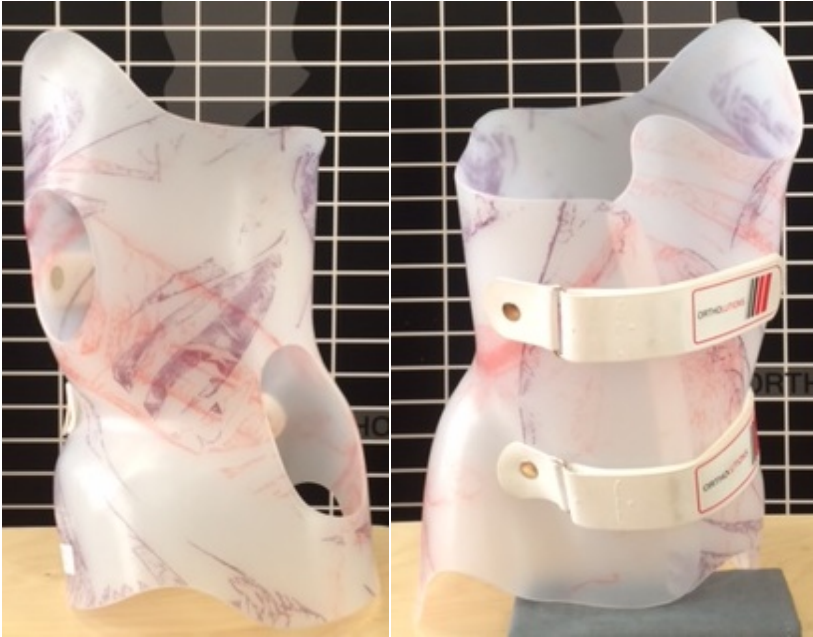
Boston TLSO (right)
Rigo-Chêneau Brace (left).

Essential differences in brace design give Rigo-Chêneau braces better derotational control over scoliosis curves.

The Rigo-Chêneau brace is designed to focus on correction of the Cobb angle as well as derotation of the spine. Measurement for the Rigo-Chêneau brace involves photographs, measurements in static and dynamic postures, and a 3D scan of the patient's body. Your brace measurements are then uploaded into a state-of-the-art computer system. We select the appropriate brace mold design and then your brace is manufactured by East Coast Orthotics according to these specifications.

Types of braces *(continued)*

The derotational properties of the Rigo-Chêneau brace allow for greater in-brace curve correction than the Boston style TLSO. There are cutouts in the brace that align with the concavities of your curves and allow for thoracic expansion and reshaping of the ribcage. The size and shape of a Rigo-Chêneau brace varies depending on your curve pattern because the brace is made specifically for you.



Our expert orthotist, John Tunney BOCPO, has years of experience with the Rigo-Chêneau brace and is available in our office so that you are able to see him at the time of the visit with your Orthopedist.

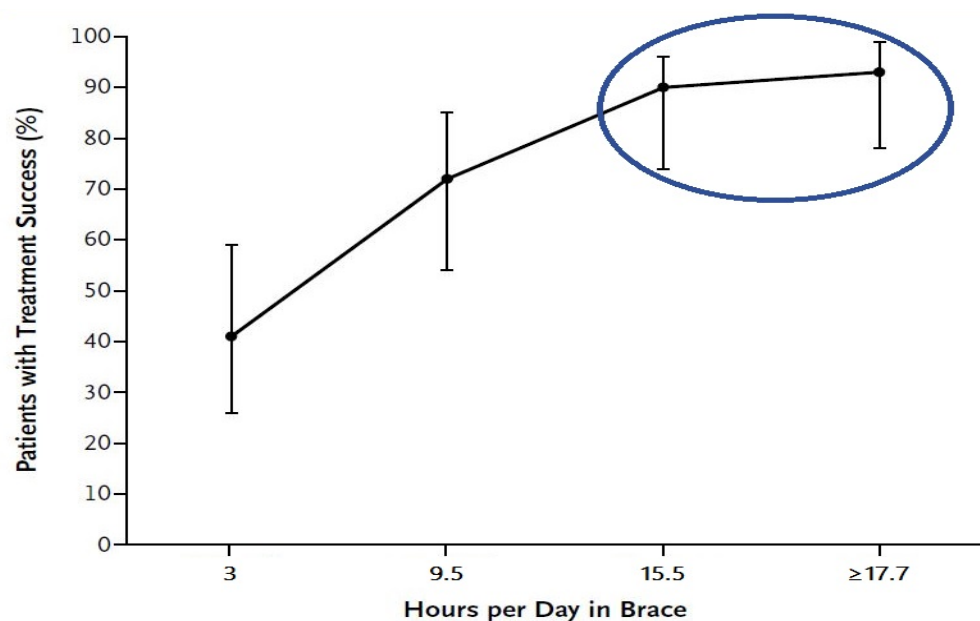
For more information on the Rigo-Chêneau brace, please visit East Coast Orthotic & Prosthetic Corp. on the web at www.ec-op.com/us-rigo-cheneau-brace

Time in the brace

For the TLSO and the Rigo-Chêneau brace, it is recommended that you wear the brace 15-18 hours a day. A recent study published in the New England journal of Medicine and funded by the NIH found that the effect of bracing is determined by the number of hours in the brace, as well as by the curve correction of the brace.

If you wear the brace less than the recommended 15-18 hours a day, it is more likely that your curve is going to progress and ultimately require surgical treatment. If there is no curve progression, the brace is usually worn until an adolescent reaches skeletal maturity, a point that varies among individuals. We use the bone age x-ray to help us determine the right time to halt bracing treatment.

The more you wear your brace, the better it works!



Adapted from: Weinstein SL, Dolan LA, Wright JG, Dobbs MB. "Effects of Bracing in Adolescents with Idiopathic Scoliosis." *The New England Journal of Medicine*. 2013 Oct 17;369(16):1512-21.

Brace follow up

Once you have been measured and fit for the brace, the orthotist will explain how to wean into the brace. The brace is like a new pair of shoes; it takes some time to get used to it and to be able to obtain the 15-18 hours a day at the desired tightness. It will take about 4 to 6 weeks to reach the 15-18 hours a day, and at that point we will have you follow up with our Nurse Practitioner to obtain an x-ray in the brace. We take this x-ray to make sure that the brace is correcting the curve. The orthotist will also be present at this appointment in case there are any changes that need to be made to the brace. For all of your other scoliosis follow up appointments, we will obtain x-rays **out** of the brace to see whether the curve has progressed. At those visits you must be out of the brace for 24 hours prior to the x-ray to eliminate any effect the brace might have on the curve.

*The series of appointments can get confusing, so we have created the guide on the **next page** to assist you.*

Bracing Protocol

You will have 4 appointments with our team. The first 3 will occur at NYP/Morgan Stanley Children's Hospital. Please refer to the guide on the next page to help you keep track of your appointments.

1. Brace Measurement Appointment

1 hour with our Orthotist John Tunney

Appointment Date _____

2. Brace Fitting Appointment

2 hours with our John Tunney

Appointment Date _____

Note: This is when you will receive your brace

3. Brace Check Appointment (and IN-BRACE x-ray)

With Jennifer Hope, NP, and John Tunney

Appointment Date _____

Note: Please schedule this appointment by calling Columbia Orthopedics. This appointment will be scheduled for 6 weeks after your brace fitting appointment.

*You will need to arrive **1 hour** early to meet with John. He will help you tighten your brace before going for the x-ray.*

4. Appointment with Your Doctor (and OUT OF BRACE x-ray)

Appointment Date _____

Note: this appointment will be scheduled for 6 months after the in-brace x-ray

*Do not wear your brace for **24 hours** prior to this appointment*

Questions?

For all questions regarding insurance authorizations for your brace, or to schedule an appointment with John Tunney for a brace measurement or fitting appointment, please contact **Angela Berberich at East Coast Orthotics (631) 392-2237**

To schedule an appointment with a Columbia Orthopedics provider, please contact our appointment scheduling team at (212) 305-4565.

Bracing Tips and Tricks

1. The undershirt you wear underneath the brace is very important. Something relatively tight fitting, seamless, and sweat wicking are all qualities to look for. This can greatly increase your comfort.

Websites that sell comfortable tank tops for underneath the brace:

www.hopescloset.com

www.embracedincomfort.com

2. You can find some clothing recommendations in the book *“Straight Talk with The Curvy Girls”*. There is a whole section of the book devoted to how to make it easier to dress with a brace on.

www.straighttalkscoliosis.com/index.html

3. Always bring your brace, x-rays, and appropriate clothing with you to your visits with the Orthopedist and the Orthotist. An example of clothing would be a snug fitting t-shirt and leggings.
4. Call your Orthotist immediately if you are having brace fit issues. You **do not** need to wait to see the doctor for these issues to be resolved.
5. Always make sure that your brace is on correctly. In most bracing systems the waist is well defined and should be the landmark for correct brace wear. If the waist is positioned properly the rest of the brace should fit as designed. Putting on the Rigo-Chêneau brace while lying down can make a big difference.

When do I stop wearing the brace?

When your growth has slowed and your Orthopedist determines that you are ready to stop wearing the brace, we will recommend a period of weaning out of the brace. Typically, we will first wean the brace to nighttime only and then at the next visit if there is no further progression, discontinue the brace all together.

During the weaning period and after the brace has been discontinued, some patients experience some back pain. This is because your core and back muscles can become weak from immobilization while in the brace. It is important that you to do exercises to maintain your core while you are wearing the brace. If you do experience back pain after you discontinue the brace, please speak with your Orthopedist. We may prescribe some physical therapy to work on your core muscles and decrease the pain.

Physiotherapeutic Scoliosis-Specific Exercise (PSSE): The Schroth Method

While the brace provides a passive correction of your scoliosis, there are certain exercises that you can do to strengthen your back and core muscles to provide *active* correction. The idea behind these exercises is to create a sort of “internal brace” to better align your spine when you are out of the brace, treat or prevent back pain, and maintain a healthy spine for life.

Our medical center is proud to offer this conservative exercise approach to the management of scoliosis, kyphosis, and other spinal conditions called the *Schroth method*. The Schroth method is a form of Physiotherapeutic Scoliosis-Specific Exercise (PSSE). Schroth exercises are founded on the principles of self-elongation and specific muscle contraction individualized to the shape of each patient’s trunk. Our therapists are trained through the Barcelona Scoliosis Physical Therapy School (BSPTS), a rigorous certification course rooted in Schroth principles and a solid understanding of the biomechanics of scoliosis.

Background

The Schroth method was invented by Katharina Schroth who had scoliosis herself. She believed that she could treat her scoliosis through exercise. She developed a set of maneuvers by using a mirror and employing targeted, chest-expanding breathing to reshape her trunk and back. Her success in addressing her own posture prompted her to then pursue an education in physiotherapy and begin treating patients. Her family has continued her legacy, and now Schroth is being practiced throughout the world.

What to expect

Our therapists care for the whole person, and not simply a painful body part. Your experience with us will begin with a thorough and comprehensive assessment with your BSPTS Schroth therapist. We will take a history and perform an exam that investigates your posture, function, movement patterns, breathing patterns, muscle performance and tissue tone. You and your therapist will work together to develop a plan of care based on your goals and tailored to your individual needs.

Your first appointment

Please bring a prescription from your referring provider, insurance information, as well as any diagnostic tests such as x-rays. *Note: if you are a patient who was seen or referred by a Columbia provider, your prescription and x-rays will be in our system, so no need to bring them to your appointment.*

Bring or wear comfortable clothes that enable you and your therapist to observe your trunk as you perform various postures and movements. For males, this includes a T-shirt and shorts. For females, this includes a sports bra or bathing suit top and shorts. You can expect to be with us for up to 45 minutes for your initial appointment.

What are the exercises like?

The exercises place a strong emphasis upon increasing your awareness of your body and the postures and movements that you habitually perform. We will also teach you how to optimize your postural muscles to achieve a more neutral position that you can incorporate into sustained positions and movements and then integrate this new awareness into your daily and recreational activities. You and your therapist may utilize mirrors, hands-on guidance, as well as external props to facilitate your optimal posture.



How many sessions should I attend?

The total duration of your program will vary based on your individual needs, but usually averages 10-15 total sessions. There are multiple options for fitting Schroth into your busy schedule. You can meet one-on-one with a therapist once a week, or you may find it more helpful to learn the exercises all at once during one or more intensive classes. Some therapists also offer group classes for the experienced student who would like extra coaching or a refresher.

Once you learn the exercises, it is important to practice at home in order to improve. We generally recommend that you practice your exercises at home for 30 minutes per day, 5 days a week to see improvement in your posture and appearance, and to reduce back pain. The intention is to incorporate Schroth exercises into your daily routine so that you can maintain your alignment for life.

How do I find a Schroth therapist in my area?

At ColumbiaDoctors we have many excellent Schroth therapists who practice at several locations, listed on the following page. However, if you live outside of the New York City area you may contact us for recommendations of therapists with whom we often work. You can also view a more expansive list on the websites below.

www.hunter.cuny.edu/pt/the-schroth-method-of-management-of-scoliosis

www.scoliosiseducationseminars.com/physical-therapists-directory.html

Schroth Physical Therapy Contacts

ColumbiaDoctors | Orthopedics

590 5th Avenue

New York, NY, 10036

NYP/Morgan Stanley Children's Hospital

3959 Broadway Floor 8 North

New York, NY, 10032

Appointments: 212-305-4878

Therapists:

Hagit Berdishevsky PT, MSPT, DPT, Cert. MDT

Prachi Bakarania, DPT, BSPTS, C2

Kelly Grimes, DPT, GCS, OCS, BSPTS, C2

ColumbiaDoctors | Tarrytown

155 White Plains Road, Suite 102

Tarrytown, NY 10591

Appointments: 914-333-2403

Therapist:

Rebekah Wallach, PT, DPT

NYP/Morgan Stanley Children's Hospital

3959 Broadway, 5th Floor North

New York, NY 10032

Appointments: 212-305-7674

Therapists:

Denise Coleman, PT, DPT. CEIM

Katie Riley, DPT, CSCS

Research

If you wish to do further reading about the conservative approach to the treatment of scoliosis, we recommend the following articles:

Weinstein SL, Dolan LA, Wright JG, Dobbs MB. "Effects of Bracing in Adolescents with Idiopathic Scoliosis." *The New England Journal of Medicine*. 2013 Oct 17;369(16):1512-21.

Sanders JO, Khoury JG, Kishan S, Browne RH, Mooney JF, Arnold KD, et al. "Predicting scoliosis progression from skeletal maturity: a simplified classification during adolescence." *The Journal of Bone and Joint Surgery*. 2008 Mar;90(3):540–53.

Kuru T, Yeldan I, Dereli EE, O Zdincler AR, Dikici F, Colak I. "The efficacy of three-dimensional Schroth exercises in adolescent idiopathic scoliosis: a randomised controlled clinical trial." *Clinical Rehabilitation*. 2015;30(2):181–190.

Monticone M, Ambrosini E, Cazzaniga D, Rocca B, Ferrante S. "Active self-correction and task-oriented exercises reduce spinal deformity and improve quality of life in subjects with mild adolescent idiopathic scoliosis. Results of a randomised controlled trial." *European Spine Journal*. 2014;23(6):1204–1214.

Schreiber S, Parent EC, Moez EK, et al. "The effect of Schroth exercises added to the standard of care on the quality of life and muscle endurance in adolescents with idiopathic scoliosis—an assessor and statistician blinded randomized controlled trial: " SOSORT 2015 Award Winner." *Scoliosis Journal* 2015;10(24).

Scoliosis Resources

National Scoliosis Foundation	www.scoliosis.org
Scoliosis Research Society	www.srs.org
Setting Scoliosis Straight	www.settingscoliosisstraight.org
Curvy Girls- scoliosis support group	www.curvygirlsscoliosis.com
SHIFT- non-profit outreach program	www.shiftscoliosis.org
Rigo-Chêneau brace	www.ec-op.com/us-rigo-cheneau-brace
Schroth Wall Bars	www.infitnessequipment.com

Peachman, R.R. "Hope for an S-Shaped Back." *The New York Times*.
well.blogs.nytimes.com/2014/05/12/hope-for-an-s-shaped-back/
Published May 12, 2014.

Notes

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What to Expect: Conservative Scoliosis Care



COLUMBIA UNIVERSITY
DEPARTMENT OF ORTHOPEDIC SURGERY
College of Physicians and Surgeons



NewYork-Presbyterian
Morgan Stanley Children's Hospital

Division of Pediatric Orthopedic Surgery
NewYork-Presbyterian/Morgan Stanley Children's Hospital
Columbia University Medical Center

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columbiaortho.org