



National University
Hospital

ADOLESCENT IDIOPATHIC SCOLIOSIS



University Spine Centre

WHAT IS SCOLIOSIS?

Scoliosis is a condition in which the spine has a curve when viewed from behind, creating a C- or S-shaped spine. Adolescent Idiopathic Scoliosis (AIS) is the most common type of scoliosis that affects children between 10 to 18 years old in two to three percent of the population and is more common in girls. Other forms of scoliosis include neuromuscular scoliosis and congenital scoliosis.

DO I HAVE SCOLIOSIS?

You may have scoliosis if you notice the following physical features:

- Clothes do not fit properly.
- Uneven shoulder height, prominent asymmetrical chest wall or waistline.
- Tilting of the body to one side.

HOW DO I KNOW IF I HAVE SCOLIOSIS?

If you notice that you have the above physical signs, it is best to consult your doctor. Your doctor may do physical examination and X-ray images to confirm the diagnosis.



WHAT IS EOS?

EOS is an X-ray system that uses significantly less radiation (up to 90%). As compared to the conventional radiography machine, spine alignment is well visualised with EOS. This makes it appropriate for children with scoliosis especially when regular X-ray examinations are required usually in standing position

EOS Low Radiation Radiographs



Normal Straight Spine



S-Shaped Spine

Conventional Radiograph



C-Shaped Spine

WHAT HAPPENS AFTER TAKING AN X-RAY?

After a standing X-ray is taken, the size of the curve is measured using Cobb Angle. This is a standard measurement which is used to determine and track the progression of scoliosis. Using Cobb Angle and other relevant parameters, your doctor will be able to assess the severity of the scoliosis and recommend an appropriate management.

Cobb Angle	Curve Severity	Treatment
0 - 10 degrees	No scoliosis	No treatment
11 - 20 degrees	Mild scoliosis	Observation
20 - 40 degrees	Moderate scoliosis	Bracing / Growth Modulation
More than or equal to 45 degrees	Severe Scoliosis	Surgery

WHAT IS THE TREATMENT FOR SCOLIOSIS?

The management options for scoliosis include observation, bracing or surgery. Exercise and a diet rich in calcium are also encouraged.

WHEN IS OBSERVATION REQUIRED?

Observation may be all that is required when the child has not entered growth spurt or has completed growth with mature spine.

WHEN IS BRACING REQUIRED?

Bracing is useful when the child is undergoing significant growth (i.e. around the time of the first menstruation for girls or when the voice starts to change for boys). The aim of wearing a brace is to prevent the curve from getting bigger and thereby preventing surgery. Each brace is custom made to suit the patient's curve and should be worn for 13 hours or more hours per day. Smart braces with an incorporated temperature logger can be used to help track the amount of time the brace is worn. Bracing is discontinued when there is no more growth, or when the Cobb Angle is beyond 40 degrees. The average bracing duration is around two to three years.

WHEN IS SURGERY REQUIRED ?

When the Cobb Angle reaches more than 40 degrees, bracing is ineffective and surgery may be advised. The aim of surgery is to prevent the deformity from worsening and to correct the scoliosis. Most patients stay in hospital for a few days and return to school one month after surgery.



Before Surgery



3 Months after Spinal Fusion Surgery

WILL MY CURVE SIZE GET BIGGER ?

The size of the curve may progress during puberty / growth spurt. This onset is highly individualised. In general, girls have earlier onset of puberty and tend to have larger curves. Your doctor would assess your growth potential and other risk factors of curve progression and recommend appropriate management.

IS THERE AN ALTERNATIVE TO BRACING ?

Based on the child's growth potential, an "internal brace" using new surgical methods such as Vertebral Body Tethering (VBT) can be used to modulate the scoliosis and improve the deformity. Discuss with your doctor to see if your child is suitable to undergo the surgery if he/she does not want to wear an external brace.



Before surgery



3 months after surgery



2 years after surgery

HOW TO TAKE CARE OF YOUR BRACE?

- Clean the brace regularly with wet wipes and dry it completely.
- Brace should not be left out in the sun or next to a heater.

WHAT ARE THINGS TO NOTE WHEN BRACING?

During your first brace visit, please wear your brace to your appointment.

For all subsequent brace visits, do not wear your brace 24 hours before your appointment.

Please bring your smart brace (if prescribed) to every appointment.

Always wear a snugly fit cotton singlet/ t-shirt/ undergarment under your brace to protect your skin.

Bathe or shower daily. Apply body lotion to areas with thickened skin.

Pay special attention to any skin redness in susceptible areas such as the armpit, rib prominence and pelvic areas.

Ensure that the brace is tightened snugly to prevent excessive skin irritation.

Stay in a well-ventilated cool and dry room.



WHEN TO CONTACT YOUR ORTHOTIST?

- Excessive pain, discomfort, skin redness or sores.
- Excessive brace wear and tear e.g. padding which is peeling off, loose or broken Velcro straps.
- Unable to fit into the brace.
- Unable to wear the brace for at least 12 hours daily.
- Brace is too loose.

MY SCOLIOSIS TRACKER

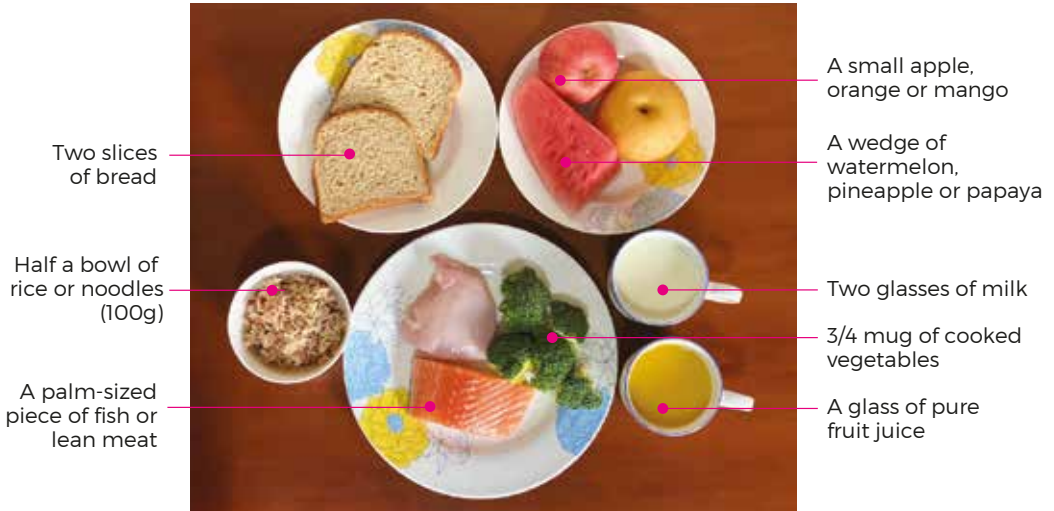
Please use the following table to track your scoliosis Cobb Angle.

Date of Visit							
Cobb Angle (°)							
Bracing Hours							

HELPFUL DIET

A balanced diet is essential to provide adequate nutrition to a growing child. The following daily serving ratio of brown rice, wholemeal bread, fruit, vegetables, meat and others at different age group are recommended by Health Promotion Board. Calcium-rich food such as milk, spinach, and anchovy are also highly recommended.

WHAT IS ONE SERVING?



WHAT IS THE RECOMMENDED DAILY SERVING?

Age	Brown Rice and Wholemeal Bread	Fruit	Vegetable	Meat and others*
3 - 6 years old	3 to 4	1	1	2
7 - 12 years old	5 to 6	2	2	3
13 - 18 years old	6 to 7	2	2	3

Includes at least one serving of dairy products and calcium-rich food.

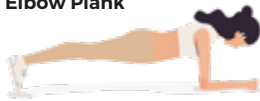
HELPFUL EXERCISES

Outdoor activities of 30 minutes per day are beneficial to a growing child. Swimming, planking and stretching exercises are helpful to improve core muscles strength and coordination.

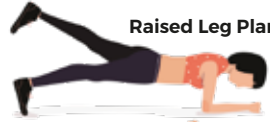
Full Plank



Elbow Plank



Raised Leg Plank



Back Stretches



Back Stretches



Back Stretches



Bird Dog



Bridging



Cat & Camel

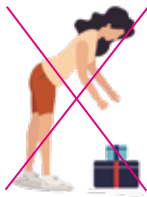


Planks

It is helpful to maintain good postures in daily activities.

Please scan the QR code for back strengthening and core muscles exercises. If you feel any pain or physical discomfort while performing the exercises, stop immediately. Consult your physiotherapist or doctor if it persists.

GOOD BODY MECHANICS



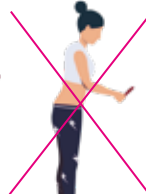
Lifting



Sitting



Carrying School Bag



Standing

LOCATE US



- ZONE A** **ZONE B** Medical Centre
- ZONE C** **ZONE D** Kent Ridge Wing
- ZONE E** Khoo Teck Puat – National University Children's Medical Institute
- ZONE F** **ZONE G** Main Building
- ZONE T** NUHS Tower Block
- +** Emergency / Children's Emergency **VR** Visitor Registration

Locations of National Centres

- ZONE B** National University Cancer Institute Singapore
- ZONE F** National University Heart Centre Singapore
- ZONE H** National University Centre for Oral Health Singapore

Ward Locations

- ZONE D** Wards 5A - 9B Register at **VR** Level 3
- ZONE G** Wards 20 - 64 Register at **VR** Level 1

CONTACT US

Orthopaedic Surgery Clinic

Kent Ridge Wing, Zone C, Level 3, C03-03
Operating Hours:
Mondays - Fridays: 8:30am - 5:30pm
Saturdays/Sundays/Public Holidays: Closed

Clinic B (Orthopaedic Surgery)

Main Building, Zone F, Level 1, F01-24
Mondays - Fridays: 8:30am - 5:30pm
Saturdays/Sundays/Public Holidays: Closed

Appointment & Enquiry: (65) 6908 2222

Fax: (65) 6773 4913

Email: spine_enquiries@nuhs.edu.sg

Website: www.nuh.com.sg/uohc

Scan QR code for full list of facilities at NUH



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