

If both assessments of Step 1 are positive for deformity, your child should proceed to Step 2. Otherwise, depending on her/his skeletal maturity, your doctor will advise on the appropriate time for the next assessment.

### Step 2: Radiological Assessment

1. A standing x-ray of the whole spine will be taken in two planes.
2. An x-ray of the left hand will also be taken to determine the skeletal maturity of your child, providing information on the potential for further growth and thus the risk of curve progression.

Your doctor will give you appropriate advice on the condition of your child and be happy to answer any question that you may have.

### References:

1. Clinical effectiveness of school screening for adolescent idiopathic scoliosis. A large population-based retrospective cohort study. K.D.K. Luk, C.F. Lee, K.M.C. Cheung, J.C.Y. Cheng, B.K.W. Ng, T.P. Lam, K.H. Mak, P.S.F. Yip, D.Y.T. Fong. *Spine* 35(17):1607-1614, August 2010
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3. Costs of school scoliosis screening. A large, population-based study. C.F. Lee, D.Y.T. Fong, K.M.C. Cheung, J.C.Y. Cheng, B.K.W. Ng, T.P. Lam, K.H. Mak, P.S.F. Yip, K.D.K. Luk. *Spine* 35(26):2266-2272, December 2010
4. Should screening for scoliosis be conducted? D.Y.T. Fong, K.D.K. Luk. *ArgoSpine News & Journal*, 24(1-2):46-49, June 2012
5. American Academy of Orthopedic Surgeons Position Statement 1122. <https://posna.org/POSNA/media/Documents/Position%20Statements/1122-Screening-for-the-Early-Detection-of-Idiopathic-Scoliosis-in-Adolescents.pdf>

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# Scoliosis in Children and Screening Service



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## What is Scoliosis?

Scoliosis is a 3-dimensional deformity of the spine. The majority of scoliosis in children have unknown etiology, thus called 'idiopathic', although there is increasing evidence to suggest that it is a genetic disease with a female-to-male ratio of 6:1. Most cases are sporadic but a positive family history is a known risk factor. Adolescent idiopathic scoliosis (AIS) presents most commonly when the child enters the growth spurt and may progress until completion of skeletal growth. Clinically one may notice prominence of one side of the chest cage, unlevel shoulder or scapula, and asymmetry of the waist line (figure 1). If left untreated, some of the curves may result in significant spinal deformity, cardiopulmonary compromise or early lumbar degeneration with back pain in later life.



Figure 1

Figure 2

## Treatment of Scoliosis

Small curves of less than 20 degrees detected early only require serial monitoring. In Hong Kong, the prevalence of large curves (>20 degrees) that need medical attention is about 1.2%. Depending on the skeletal maturity of the child at diagnosis, closer monitoring may be necessary. Bracing is indicated for curves that are progressive, especially of the immature children (figure 2). Surgical correction and fusion will be considered for curves above 45 degrees (figure 3). Your doctor will be able to discuss with you in more detail.

Without knowing the exact genetic etiology, primary prevention of adolescent idiopathic scoliosis (AIS) is not possible. However, secondary prevention can

be achieved by early detection of the disease in the population. Bracing is proven to be effective in altering the natural history of the curve progression, thus avoiding major and high risk spinal fusion surgeries.

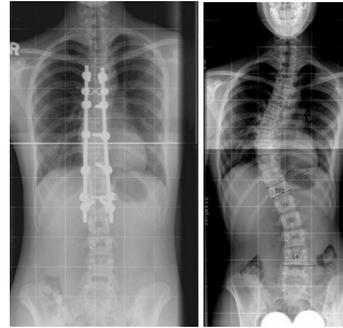


Figure 3

## Early Detection

A comprehensive scoliosis school screening programme for Hong Kong was started by the University of Hong Kong in 1995 in collaboration with the Department of Health (DH). To date it is one of the most successful, sustainable, and cost-effective programme in the world. Over these years, over 2 million students have benefited from this programme. Today the DH is still screening more than 250,000 students annually, feeding patients to the tertiary subspecialist clinics at the two universities. Our results are now being regarded as the benchmark internationally and we are the undisputable leader in this field.

About 90% of school children in Hong Kong are already participating in this programme. However, a minority of students for various reasons have not signed up, resulting in late recognition of scoliosis and delayed treatment.

## Comprehensive Scoliosis Service at HKSH

Hong Kong Sanatorium & Hospital is now providing the first and only comprehensive Scoliosis Service in the private sector. The service includes:

1. A screening programme for children of all ages to be conducted at the Hospital and clinics of HKSH Medical Group, with special focus on adolescents of 9-16 years old.
2. A non-operative programme for the mild curves with bracing and physical therapy as appropriate.
3. A highly skilled, tertiary level, surgical service at HKSH with the latest technologies.

## The Screening Programme

Your child is about to undergo the scoliosis screening programme which involves the following procedures:

**Step 1: A clinical examination will be performed by a doctor or a trained nurse.**

1. **Scoliometer:** Your child will be asked to bend forward with the back exposed and the arms relaxed and dangling in front. A ruler (scoliometer) will be run from the lower neck down to the tail bone (figure 4). Any asymmetry between the two sides of her/his back will be recorded as Apical Truncal Rotation (ATR). An ATR of above 5 degrees suggests a possible scoliosis.
2. **Moire Topography Examination:** The shadow of some gridlines will be casted over the exposed back with her/him standing behind a pane of special transparent glass. A photograph of the shadow topographic lines will be taken (figure 5). A difference of more than 2 lines between the two sides of the back would suggest a possible scoliosis. This is a purely optical assessment and does not involve any ionizing radiation.



Figure 4

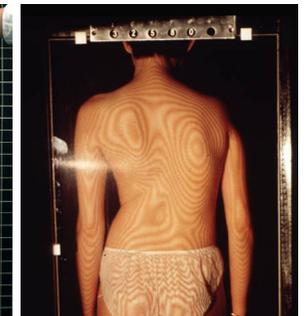


Figure 5