

## MEDIA RELEASE

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For Immediate Release

### STAYING AHEAD OF THE CURVE: SCOLIOSIS SCREENING PROGRAMME FOR ADOLESCENTS GETS A BOOST

*Screening capacity is expanded with the aid of an ultra-low radiation x-ray system, smart brace and central database project to enhance early diagnosis and treatment efficacy*

Singapore — The University Spine Centre at the National University Hospital (NUH) has ramped up its diagnostic and monitoring capabilities at the hospital and its satellite clinic, the Scoliosis Specialist Clinic, to enhance screening for the early detection and treatment of Adolescent Idiopathic Scoliosis (AIS). With the aid of an ultra-low radiation imaging system, the centre and clinic can now better support the health screening conducted for upper primary and secondary school students. This allows adolescents with AIS to have timely management before they reach full skeletal maturity, so as to reduce the need for surgery.

Located at the Health Promotion Board (HPB) Building, the NUH Scoliosis Specialist Clinic first started in 2008 and is an offsite clinic specialising in scoliosis treatment and management that sees adolescent cases from all around Singapore.

Doctors at both the University Spine Centre and the Scoliosis Specialist Clinic utilise an ultra-low radiation x-ray system to capture detailed x-ray images of the spine, that aid scoliosis diagnosis and monitoring. The standing x-ray machine uses significantly less radiation than conventional x-ray machines which makes it suitable for adolescents who require regular x-ray examinations to monitor for curve progression of scoliosis. Specialists use Cobb Angle (a standard measurement of the size of the spinal curve to quantify and track the progression of scoliosis) and other relevant parameters such as body asymmetry and skeletal maturity to assess the severity of patients' spinal deformity in order to recommend them suitable management options.

#### **Adolescent Idiopathic Scoliosis (AIS)**

Scoliosis is a condition of having an abnormal side-to-side curvature of the spine for which the cause is unknown. AIS is the most common type of scoliosis that affects adolescents between the ages of 10 and 18 years old in about 2-3 per cent of the population. Scoliosis is more common in girls than in boys, and it affects all races. The curved spine results in tilted shoulders and asymmetrical waistline.

Students who may potentially have AIS are usually detected through the annual school health screening. They are then referred to HPB's Student Health Centre to be assessed by doctors. The ultra-low radiation x-ray system at the University Spine Centre and the Scoliosis Specialist Clinic are now available to these doctors to reach a definite diagnosis early and more accurately. The patients are then referred to specialists for treatment – suitable patients can benefit from smart braces that are able to monitor brace-wear compliancy.

Bracing is prescribed for AIS to stop the progression of the spinal curve. Patients with scoliosis need to be monitored regularly with x-ray examinations every six to 12 months until they reach skeletal maturity. The rate of scoliosis progression varies among adolescents. Some see very little progression while others may experience very rapid deterioration of the condition over a short time. Uncontrolled scoliosis progression may result in severe spinal deformity and restrictions of lungs and heart functions, particularly when the curves progress to more than 90 degrees.

Assistant Professor Lau Leok Lim, Senior Consultant in the Department of Orthopaedic Surgery, NUH, said, “The NUH University Spine Centre and the Scoliosis Specialist Clinic are committed in boosting scoliosis screening programme for adolescents. We are adopting a safer technology for scoliosis screening to allow early and precise diagnosis. Once diagnosed, suitable patients are managed with a smart brace to improve brace wear-time. This has been shown to reduce the risk of surgery significantly. For every three braces prescribed one surgery could be averted, provided the patient is compliant with the wear-time. The screening process is closely monitored. We are updating our screening programme in the age of big data to give our patients the best possible outcomes.”

Since the inception of the programme, more than 50 patients have been managed with smart braces. Preliminary results from a pilot study at NUH earlier suggest that 60% of the patients were compliant with the wear-time while on the smart braces.

### **Central database for AIS**

Since July 2020, the NUH University Spine Centre has also teamed up with KK Women’s and Children’s Hospital and the Student Health Centre at HPB to establish a central database for AIS which will pool and collect information on various aspects of local adolescents with the condition. The quality of life of patients under different treatment categories such as watchful observation, smart bracing and surgery is being monitored closely.

The central database project is led by Assistant Professor Lau who was awarded a Health Service Development Programme grant by the Ministry of Health in 2018 to improve the process of scoliosis screening nationally. The project encourages the adoption of the evidence-based medicine among the specialists with the aim of stopping scoliotic curve progression early on to avoid surgery, by increasing school students’ participation in scoliosis screening, and promoting greater treatment compliance by using smart braces. Adolescents who have difficulties with brace-wearing will be counselled and supported in their course of treatment.

Associate Professor Kevin Lim, Chairman, Division of Surgery and Senior Consultant at the Department of Orthopaedic Surgery, KK Women’s and Children’s Hospital, and co-investigator with Assistant Professor Lau for the central database project said, “To help arrest the condition and even avoid surgical intervention, early scoliosis screening among minors is important. The database will help give better insights to scoliosis progression and responses to treatment.”

The central database project has recruited about 3,000 students since it started, and it will be completed in 2023. Thereafter, NUH plans to extend the efforts by working with researchers in Artificial Intelligence to provide real time analytics that can guide the scoliosis screening programme.

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### Chinese Glossary

Adolescent Idiopathic Scoliosis (AIS)	青少年原发性脊柱侧凸
University Spine Centre	国大脊椎中心
Scoliosis Specialist Clinic	脊柱侧凸专科诊所
Assistant Professor Lau Leok Lim Senior Consultant Department of Orthopaedic Surgery National University Hospital	刘录霖助理教授 高级顾问医生 骨科外科部门 国立大学医院

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### **About the National University Hospital**

The National University Hospital is a tertiary hospital and major referral centre with over 50 medical, surgical and dental specialties, offering a comprehensive suite of specialist care for adults, women and children. It is the only public hospital in Singapore to offer a paediatric kidney and liver transplant programme, in addition to kidney, liver and pancreas transplantation for adults.

The hospital was opened on 24 June 1985 as Singapore's first restructured hospital. Each year, the Hospital attends to more than one million patients.

As an academic health institution, patient safety and good clinical outcomes are the focus of the Hospital. It plays a key role in the training of doctors, nurses, allied health and other healthcare professionals. Translational research is pivotal in the Hospital's three-pronged focus, and paves the way for new cures and treatment.

A member of the National University Health System, it is the principal teaching hospital of the NUS Yong Loo Lin School of Medicine and the NUS Faculty of Dentistry.