

If your child is already on CPAP or BiPAP for the treatment of OSA, he or she may be asked to undergo a CPAP or BiPAP Titration study from time to time. This is essentially a sleep study conducted while the child is using the CPAP or BiPAP machine to ensure that the pressures delivered by the device is treating the OSA adequately.

Sleep Study Procedure

Dear Sir/Mdm _____

Thank you for choosing Khoo Teck Puat – National University Children’s Medical Institute (KTP-NUCMI) for your child’s medical needs. We wish to inform you that your child has been scheduled for Sleep Study / BiPAP Titration / CPAP Titration on (Date) _____.

On the day of the admission, you and your child are required to report directly to:

- **Venue:** Paediatric Sleep Laboratory, NUH Main Building, Zone G, Level 4
- **Time:** 8.30pm

Kindly ensure that your contact number is up to date as our staff will give you a confirmation call or SMS one week before your child’s scheduled admission date. This would also serve as a reminder.

Please contact us at least three working days in advance to reschedule the admission if you and your child are unable to make it.

What should I take note of?

Before undergoing the sleep study, we encourage your child to:

- Avoid taking naps in the afternoon
- Wash his or her hair before the sleep study, keep his or her hair clean and avoid using any hair creams, oils or gels
- Have his or her dinner before admission
- Be punctual for the admission
- Refrain from taking any medication before the test

- Bring along a set of comfortable sleep clothing, his or her preferred pillow or bolster and favourite bedtime toy, if any
- Inform the doctor, nurse or sleep lab technician if he or she is not feeling well as the sleep study may need to be postponed

Reminders to parents or caregivers

- Bring your child’s CPAP or BiPAP machine and mask if he or she is already using them.
- Bring along toiletries (comb, toothbrush, toothpaste, shampoo and shower cream) for you and your child.
- Bring the following documents, if applicable:
a) Medisave Account Holder’s NRIC
b) Medical Claims Authorisation Form (Single Institution) with the signature of the Medisave Account Holder

On the second page of the form, under the “General” section, please sign under the “Patient” and “Additional Medisave Payer” fields only.

Contact Us

Should you have further enquiries prior to your child’s admission or procedure(s), please contact us at the Paediatric Sleep Laboratory:

Telephone:
+65 9724 9445 (24 hours daily)

The information provided in this publication is meant purely for educational purposes and may not be used as a substitute for medical diagnosis or treatment. You should seek the advice of your doctor or a qualified healthcare provider before starting any treatment or if you have any questions related to your health, physical fitness or medical condition.

About the Khoo Teck Puat – National University Children’s Medical Institute (KTP-NUCMI)

The KTP-NUCMI is the paediatric arm of the National University Hospital and comprises the Departments of Paediatrics, Paediatric Surgery and Neonatology. We provide comprehensive and specialised medical and surgical services for newborns, children and adolescents. NUH is the only hospital in Singapore that offers paediatric kidney and liver transplant programmes. Through a generous gift from the Estate of Khoo Teck Puat, we have set up an integrated outpatient facility with medical, diagnostic and rehabilitation services.

For more information about us, visit www.nuh.com.sg/ktp-nucmi.

Contact Us

24-hour Children’s Emergency

Location: NUH Main Building, Zone F, Level 1
General Enquiry: +65 6772 5000

KTP-NUCMI

Location: NUH Main Building, Zone E, Level 2
(Accessible via Kent Ridge Wing, Zone C, Level 2, Lift Lobby C)
Operating Hours: 8.30am – 5.30pm (Mon to Fri), 8.30am – 12.30pm (Sat)
General Enquiry: +65 6772 5736 Appointment Line: +65 6908 2222
Email: ktpnucmi_appt@nuhs.edu.sg

9a Viva-University Children’s Cancer Centre

Location: NUH Medical Centre, Zone B, Level 9
Operating Hours: 8am – 5.30pm (Mon to Fri)
Appointment Line: +65 6772 5030 Fax: +65 6872 4314
Email: cbccappt@nuhs.edu.sg

NUH Children’s Urgent Care Clinic @ Bukit Panjang

Location: Junction 10, 1 Woodlands Road, #01-22, Singapore 677899
Operating Hours: 9am – 11pm daily (including public holidays)
General Enquiry: +65 6219 1538 Email: childrenucc@nuhs.edu.sg
Website: www.nuh.com.sg/ucc

NUH Child Development Unit @ JMC

Location: Jurong Medical Centre,
60 Jurong West Central 3, Level 2, Singapore 648346
Operating Hours: 8.30am – 5.30pm (Mon to Fri)
Appointment Line: +65 6665 2530/2531 Fax: +65 6665 0158
Email: cdu@nuhs.edu.sg Website: www.nuh.com.sg/cdu

NUH Child Development Unit @ Keat Hong

Location: Keat Hong Community Club,
2 Choa Chu Kang Loop, #03-01, Singapore 689687
Operating Hours: 8.30am – 5.30pm (Mon to Fri)
Appointment Line: +65 6769 4537/4637 Fax: +65 6665 0158
Email: cdu@nuhs.edu.sg Website: www.nuh.com.sg/cdu

National University Hospital

Location: 5 Lower Kent Ridge Road, Singapore 119074
Tel: +65 6908 2222 Email: contactus@nuhs.edu.sg
Website: www.nuh.com.sg



Scan QR code for
NUH Campus Map

Information is correct at the time of printing (Nov 2023) and subject to revision without prior notice.



Obstructive Sleep Apnoea in Children



Khoo Teck Puat – National University Children’s Medical Institute

What is Obstructive Sleep Apnoea?

Obstructive Sleep Apnoea (OSA) is a breathing disorder caused by the blockage of the upper airway passage during sleep which thus affects normal air movement, causing a drop in the body's oxygen level and recurrent waking at night.

Children with OSA are usually unaware that their sleep has been interrupted.

OSA can therefore lead to poor sleep quality which may have widespread effects on the rest of the body such as learning, behavioural, growth and heart problems.

Who is at risk for OSA?

OSA occurs in approximately 1-5% of children (DeRosso L. M., 2016). While snoring is one of the most common symptoms of OSA, not all children who snore have the disorder.

Children who are at a higher risk of having OSA are most likely to:

- Snore regularly, not only when tired or unwell
- Be overweight
- Have enlarged tonsils and adenoids
- Have some physical abnormality in the upper airway such as defects in the structures of the mouth, jaw or throat
- Have neuromuscular weakness
- Have a family member with OSA

Reference
DeRosso L. M. (2016). Epidemiology and Diagnosis of Pediatric Obstructive Sleep Apnea. *Current problems in pediatric and adolescent health care*, 46(1), 2-6.

What are the symptoms of OSA?

The symptoms of OSA include:

- Frequent, regular snoring
- Grunting and snorting noises while sleeping
- Shallow or stoppage of breathing during sleep followed by choking, gasping or awakening
- Restlessness during sleep with frequent tossing and turning
- Unusual sleeping postures such as sleeping with head hyper-extended
- Bedwetting
- Chronic mouth breathing
- Disturbed and restless sleep
- Headaches in the morning
- Excessive daytime sleepiness (less common in children compared to adults) or hyperactivity

Please consult a doctor for a proper diagnosis if you suspect that your child has OSA. Your doctor may refer your child for a sleep study or other investigations if needed.

Why should my child see a doctor?

A good night's sleep is vital for your child's development and growth. If OSA is undiagnosed and untreated, it can cause:

- Disturbed and restless sleep
- Headaches in the morning
- Learning difficulties or poor school performance
- Developmental delay
- Abnormal behaviour, hyperactivity or behavioural disorder
- Poor growth including poor weight gain
- High blood pressure
- Excessive daytime sleepiness

How is OSA diagnosed?

It can be difficult to diagnose OSA in a child based on history and physical examination as there may be many reasons for disturbed and restless sleep.

The current definitive tool for diagnosing OSA is an overnight sleep study (polysomnography).

Multiple Sleep Latency Test may also be conducted if your child has excessive daytime sleepiness.

Sleep Study (Polysomnography)

A sleep study records a variety of body parameters when your child is sleeping. This special test is used to diagnose OSA as well as to determine its severity.

The sleep study has to be conducted overnight in a hospital. Your child will be admitted to the sleep study room at night. A parent or caregiver is encouraged to stay with your child throughout the night so that your child may feel more reassured.

During the admission, your child's medical history and complaints, if any, will be recorded. Your child will also undergo a short physical examination. Your child may require investigations such as a full blood count, an electrocardiogram (ECG) and a chest X-ray.

The study will begin when your child is about to fall asleep. Several sensors or leads will be attached to the head, eyes, nose, mouth, chest, abdomen and limbs. All the leads will then be connected to a data storage unit from which information is downloaded into the main computer system for evaluation and assessment.

You need not worry about your child being 'wired up' to the cables as all the leads are only sensors that pick up signals and do not have electrical currents flowing through them. Your child may experience some slight discomfort when wearing the leads and when the adhesive tapes are removed at the end of the study. Our staff, who are trained to work with children and

their family or caregivers, will also stay with your child throughout the study and reattach any leads that fall off during the night. These sensors are routinely used for young children so please do not worry that your child may not tolerate them.

Treatment

Treatment is tailored to each child based on the severity of his or her OSA. Medications are generally not effective in the treatment for OSA.

- **Weight Reduction**
An overweight child can benefit from weight loss. Even a 10% weight reduction can significantly reduce the symptoms of OSA if obesity is the primary cause.
- **Surgery**
Many children with OSA have enlarged tonsils and adenoids. These children will have to undergo a surgery called adenotonsillectomy (removal of tonsils and adenoids) which will be performed by an ear, nose and throat surgeon under anaesthesia. The surgery usually takes approximately 30 minutes and may be done as an outpatient procedure or may require a short hospitalisation. The child is generally able to consume food soon after the operation.

The majority of children with OSA do not require any further treatment after adenotonsillectomy.

- **Other Treatment Options**
Breathing assistance devices such as the Continuous Positive Airway Pressure (CPAP) or Bilevel Positive Airway Pressure (BiPAP) machine can be used in patients with severe OSA that cannot be treated with surgery alone. A mask is placed over the nose and the pressure from the device pushes air through the obstructed airway, enabling the child to breathe and sleep more comfortably.