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WANTED FOR STUDY: 1,000 COUPLES ACTIVELY TRYING FOR A BABY

KKH leads Singapore's largest pre-pregnancy study to investigate links between women's health and long term maternal-fetal well-being.

Report by Rebecca Tse

KK Women's and Children's Hospital (KKH) is leading Singapore's first large-scale preconception study investigating the links between mothers' health and the health of their baby, and participants are sought.

The study, named S-PRESTO (Singapore PREconception Study of long-Term maternal and child Outcomes), is a collaboration between KKH, Singapore Institute for Clinical Science (SICS) of the Agency for Science, Technology and Research (A*STAR), and National University Health System (NUHS).

The ground-breaking pre-conception study is Singapore's largest thus far, and is actively recruiting Chinese, Malay and Indian couples who are planning pregnancy.

"Our aim is to study 1,000 local couples who are actively planning for pregnancy – to examine their nutrition, lifestyle, mental health, and other environmental factors before and during pregnancy, and understand how these influence and impact the eventual health and socio-emotional outcomes of the mother and baby," says Associate Professor Jerry Chan, KKH Principal Investigator, S-PRESTO, who is also Director, KK Research Centre; and Senior Consultant, Department of Reproductive Medicine, KKH.

"This data is extremely valuable to help inform and enhance health outcomes for every birth in Singapore."

In the longer term, S-PRESTO aims to develop more effective approaches to the early intervention and prevention of metabolic diseases and neurodevelopmental disorders.

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ENHANCING HEALTH OUTCOMES FOR EVERY BIRTH IN SINGAPORE

S-PRESTO is the latest in a line of studies under GUSTO (Growing Up in Singapore Towards healthy Outcomes), Singapore's largest and most comprehensive birth cohort study, funded by the Ministry of Health.

"GUSTO showed us that the mother's health during pregnancy affects the child's health outcomes. This led us to question the influences of the couple's health on the child even before the mother is pregnant, as positively suggested by some international studies.

"S-PRESTO was thus launched as a local study which will focus on the preconception stage, through to when the child is two years old," says Assoc Prof Chan.

One of the many pregnancy-related problems S-PRESTO seeks to investigate, and eventually be able to predict, is gestational diabetes and its impact on postnatal health.

"One of the big health issues we are dealing with is an increasing incidence of gestational diabetes. By charting women's health before they develop gestational diabetes, we should be able to identify risk factors and target our health resources to address these even before a woman falls pregnant," says Assoc Prof Chan.

Investigating the pre-conception stage

"Collaborating with KKH on S-PRESTO enables us to investigate the important clinical window known as the preconception stage in great detail through a large study cohort," says Assoc Prof Chong Yap Seng, Executive Director, Singapore Institute for Clinical Sciences (SICS) of the Agency for Science, Technology and Research (A*STAR), and Senior Consultant, National University Health System (NUHS).

"S-PRESTO also provides a critical opportunity to validate and extend our findings from GUSTO, including associations between specific epigenetic 'marks' and developmental outcomes in the offspring, and paves the way for better maternity and child care in the future."

S-PRESTO study lead investigators, A/Prof Jerry Chan, Director, KK Research Centre, KKH (right); and A/Prof Chong Yap Seng, Executive Director, Singapore Institute for Clinical Sciences, A*STAR (middle); demonstrating a test which a S-PRESTO participant will undergo.

Better health for the next generation of babies

In addition to capturing a woman's health before pregnancy, the study will also measure how the baby adapts to life after birth, and the development of the child's learning cognitive functions, linking these back to the mother's health status before she fell pregnant.

"Today's children are tomorrow's future," says S-PRESTO co-investigator, Assoc Prof Fabian Yap, Head and Senior Consultant, Endocrinology Service, KKH.

"If today's girls are in poor health, when they grow up, they will conceive the next generation of citizens who may have health issues. This is a vicious cycle of the natural world.

This study is a unique opportunity for us to discover the connection between a woman's health and its impact on her baby. Once we unravel the mystery, we hope to have healthy babies for the next generation."

IS SOMEONE YOU KNOW TRYING FOR A BABY?

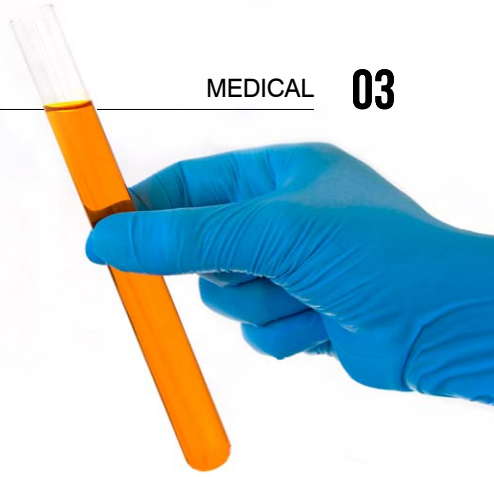
The S-PRESTO study is recruiting couples who meet the following criteria:

- Couples where the wife is 18 to 45 years old
- Currently residing in Singapore, and intending to reside in Singapore for the next five years
- Couples who are actively planning pregnancy
- Chinese, Malay or Indian
- Intending to receive antenatal care and deliver at KKH

Information will be gathered from these couples from the time they plan to conceive, through to successful conception, and until their child is two years old. Under S-PRESTO, participants and their future offspring will receive complimentary investigations and reports until their children are two years of age.

For more information on S-PRESTO, or to participate in the study, please visit www.s-presto.sg or call 1800-SPRESTO (1800-777 3786).

S-PRESTO is supported by Singapore National Research Foundation under its Translational and Clinical Research Flagship Programme, and administered by National Medical Research Council, Ministry of Health, Singapore.



DNA TEST PREVENTS ANTICONVULSANT ALLERGIES

Report by Rebecca Tse

KK Women's and Children's Hospital (KKH) has introduced a DNA screening test to identify patients who are allergic to carbamazepine – an anticonvulsant medication commonly used in the management of paediatric epilepsy and other neurological conditions.

The test screens for the HLA-B*1502 gene pattern, which is strongly associated with severe cutaneous drug reactions (SCDR) to carbamazepine in Chinese, Thai, Malay and Indian populations. In Singapore, HLA-B*1502 occurs in 12.5 percent of Chinese, 20 percent of Malays and four percent of Indians.

"The availability of HLA-B*1502 testing at KKH enables rapid and accurate screening before initiating anticonvulsant treatment. This facilitates optimal clinical management for patients and helps prevent severe drug allergies," says Dr Derrick Chan, Head and Senior Consultant, Department of Paediatrics, Neurology Service, KKH. "At KKH, all patients for whom treatment with carbamazepine is considered must first undergo HLA-B*1502 screening, to ensure medicine safety."

GENE ASSOCIATED WITH ALLERGY TO ANTICONVULSANT MEDICATION

Epilepsy is a condition which causes recurrent seizures without an immediate cause. The paediatric neurology team at KKH diagnose 75 to 100 new patients with childhood epilepsy each year, and provide follow-up care to hundreds more. A significant proportion of patients require treatment with anticonvulsants to control their seizures – one of the most common of which is carbamazepine.

A paediatric study[1] by KKH found that HLA-B*1502 positivity increases the odds of carbamazepine-induced SCDR in Singapore children of Chinese and Malay ethnicity. These severe adverse drug reactions occurred within two weeks of the patient commencing carbamazepine therapy, and at low doses.

HLA-B*1502 TEST SAFETY MEASURE TO PREVENT ALLERGIC REACTION

From January 2014 to 2015, the hospital screened 87 patients, and identified nine as positive for HLA-B*1502. These patients were thus prevented from exposure to the risk of severe allergies to carbamazepine, namely Steven Johnson syndrome and toxic epidermolytic necrolysis (SJS/TEN) – two forms of a life-threatening skin disease that cause rash, skin peeling, and sores on the mucous membranes.

As one of only two recognised centres in Singapore to offer the test, KKH accepts samples for testing from other healthcare institutions.

CASE STUDY:

UTILITY OF HLA-B*1502 TESTING IN A PAEDIATRIC PATIENT

Four-year-old Kelvin* suffered from focal epilepsy seizures, which were becoming more frequent, necessitating hospital admission. To relieve his seizures, Steven's KKH care team advised early initiation of anticonvulsant treatment with carbamazepine.

As a safety measure, Steven first underwent HLA-B*1502 screening at KKH, to ensure that he would be at low risk for an allergic reaction to carbamazepine. Laboratory results returned the next day showed Steven was negative for HLA-B*1502, and he was able to promptly commence carbamazepine therapy to control his seizures.

The HLA-B*1502 test played an important role in ensuring Steven's safety. It simplified the counselling on treatment and reassured his medical care team and parents that he was not at risk of a severe drug allergy to the prescribed medication.

*Not his real name

ORDER AN ANTICONVULSANT ALLERGY TEST

Paediatricians, neurologists and geneticists who wish to order anticonvulsant allergy testing for their patients can contact KKH's DNA Diagnostic and Research Laboratory (DDRL) at **+65 6394 1395/6** for information about sending samples. Results are available within two working days and can be viewed in the National Electronic Health Record (NEHR).

REFER A PATIENT FOR ASSESSMENT

Doctors can also refer patients to the paediatric neurology team at KKH for assessment, by contacting the hospital at **+65 6294 4050**.

References

1. 'Association of carbamazepine-induced severe cutaneous drug reactions and HLA-B*1502 allele status, and dose and treatment duration in paediatric neurology patients in Singapore.' Arch Dis Child. 2014 Jun; 99(6):581-4. doi: 10.1136/archdischild-2013-304767. Epub 2013 Nov 13.

FIGHTING CHILDHOOD FEVERS

Dr Zaw Lwin, Associate Consultant, Department of Emergency Medicine, KK Women's and Children's Hospital

Fever is a normal physiological response to illness, which facilitates and accelerates recovery. The condition is common in children, and often benign and self-limiting. However, as childhood fever may be associated with increased morbidity in children, it frequently causes concern among parents and healthcare providers, and is consequently one of the most common reasons for which children are brought to seek medical attention.

In most cases, fever is a presenting symptom of a self-limiting viral infection. However, it may also be associated with serious bacterial infections, such as meningitis and pneumonia, and other non-infective illnesses such as Kawasaki's disease and malignancy.

Thus it is important for healthcare professionals to determine the underlying illness causing the fever, and to identify children with life-threatening features and those at risk of serious illness so that timely intervention and proper referral can be made.

The most common causes of fever seen in children who seek treatment at the Children's Emergency department at KK Women's and Children's Hospital include viral fevers, upper respiratory tract infections and gastroenteritis.

GUIDELINES FOR CLINICAL ASSESSMENT AND MANAGEMENT OF FEVERS IN CHILDREN

1. Identify and treat immediate life-threatening features

Be alert to features such as compromised airway, breathing or circulation, and decreased level of consciousness.

2. Conduct thorough history-taking and systematic examination

After stabilising the child with fever, a thorough history-taking and systematic examination should be carried out to determine the underlying cause of the fever and assess the child for risk of serious illness.

It is crucial to measure and record the child's vital signs such as temperature, heart rate, respiratory rate and capillary refill time. Signs of dehydration such as prolonged capillary refill time, abnormal skin turgor, abnormal respiratory pattern, weak pulse and cool extremities should also be assessed.

3. Identify and treat features suggestive of specific diseases (Table 1)

TABLE 1. FEATURES IN CONJUNCTION WITH FEVER THAT ARE SUGGESTIVE OF SPECIFIC DISEASES

DIAGNOSIS TO BE CONSIDERED	FEATURES IN CONJUNCTION WITH FEVER
Meningococcal disease	Non-blanching rash, particularly with one or more of the following features: • an ill-looking child • lesions larger than 2 mm in diameter (purpura) • capillary refill time of ≥3 seconds • neck stiffness
Kawasaki disease	Fever for more than 5 days, and at least four of the following features: • bilateral conjunctival injection • change in mucous membranes • change in the extremities • polymorphous rash • cervical lymphadenopathy
Bacterial meningitis	• Neck stiffness • Bulging fontanelle in infants • Decreased level of consciousness • Convulsive status epilepticus
Herpes simplex encephalitis	• Focal neurological signs • Focal seizures • Decreased level of consciousness
Septic arthritis	• Swelling of a limb or joint • Avoiding use of, or bearing weight on, an extremity
Pneumonia	• Tachypnoea > 60 breaths/minute, age 0–5 months; > 50 breaths/minute, age 6–12 months; > 40 breaths/minute, age more than 12 months • Crackling sounds in the chest • Nasal flaring • Chest indrawing • Cyanosis • Oxygen saturation ≤95%
Urinary tract infection	• Vomiting • Poor feeding • Lethargy • Irritability • Abdominal pain or tenderness • Urinary frequency or dysuria

"Children with features indicating low risk of illness can be cared for at home; however, it is important to diagnose and treat the underlying cause of fever appropriately."

4. Assess the risk of serious illness in children with fever (Table 2)

TABLE 2. TRAFFIC LIGHT SYSTEM FOR ASSESSING RISK OF SERIOUS ILLNESS IN CHILDREN YOUNGER THAN FIVE YEARS

FEATURE	LOW RISK	INTERMEDIATE RISK	HIGH RISK
Colour (skin, lips or tongue)	• Normal colour	• Pallor reported by parent or carer	• Pale/mottled/ashen/blue
Activity	• Responds normally to social cues • Content/smiles • Stays awake or awakes quickly • Strong normal cry/not crying	• Not responding normally to social cues • No smile • Wakes only with prolonged stimulation • Decreased activity	• No response to social cues • Appears ill to a healthcare professional • Does not wake or if roused does not stay awake • Weak, high-pitched or, continuous cry
Respiratory		• Nasal flaring • Tachypnoea - respiratory rate: >50 breaths/minute, age 6–12 months >40 breaths/minute, age >12 month • Oxygen saturation ≤95% in air • Crackles in the chest	• Grunting • Respiratory rate >60 breaths/minute • Moderate or severe chest indrawing
Circulation and hydration	• Normal skin and eyes • Moist mucous membranes	• Dry mucous membranes • Poor feeding in infants • Reduced urine output • Capillary refill time ≥3 seconds • Tachycardia: >160 beats/minute, age <12 months >150 beats/minute, age 12–24 months >140 beats/minute, age 2–5 years	• Reduced skin turgor
Other		• Age 3–6 months, temperature ≥39°C • Fever for ≥5 days • Rigors • Swelling of a limb or joint • Non-weight bearing limb/ not using an extremity	• Age <3 months, temperature ≥38°C • Non-blanching rash • Bulging fontanelle • Neck stiffness • Status epilepticus • Focal neurological signs • Focal seizures

Source: NICE Clinical Guideline on Feverish illness in children: Assessment and initial management in children younger than 5 years, National Institute for Health and Care Excellence, United Kingdom, May 2013

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CARING FOR CHILDREN WITH FEVER AT HOME

Children with features indicating low risk of illness can be cared for at home; however, it is important to diagnose and treat the underlying cause of fever appropriately. The healthcare professional plays an essential role in diagnosis and treatment, as well as educating parents on appropriate home care for the child.

Parents should be advised on measures to reduce the child's body temperature in order to help comfort the child, and when to seek further medical attention so that timely assessment and referral can be done.

Physical measures to reduce body temperature

Physical measures, such as wearing thin clothing and tepid sponging can be considered if the child's body temperature is above 39.5 degrees Celsius. However, possible discomfort such as shivering should be kept in mind.

Allowing the child to rest in a cool environment and providing more fluids are other physical measures which should be considered to reduce the child's body temperature.

Role of antipyretics

Paracetamol and ibuprofen can be used as long as the child appears distressed by the fever. When comparing alternating therapy with combined therapy, using paracetamol and ibuprofen, there is no statistically significant difference in mean temperature, or the number of febrile children at one, four or six hours.

The caregiver is recommended to provide paracetamol four- to six-hourly as a first-line medication, and to use ibuprofen only when the fever is still rising one hour after paracetamol has been given.

Role of antibiotics

Antibiotics should not be prescribed to children with fever without apparent source, as the fever is a symptom of a self-limiting viral infection in most cases.

However, a dose of parenteral antibiotics (either benzylpenicillin or a third generation cephalosporin) should be given at the earliest opportunity in children with suspected meningococcal disease.

Parental education and advice

Parents of children with features indicating low risk of illness should be advised to seek medical advice if:

- Fever persists at a consistently high level without a decreasing low point after three days of illness
- Persistent and significant vomiting or significantly poor feeding develops
- Drowsiness, fits, irritability, significant headache or breathing difficulty develops
- The child turns pale or blue, or non-blanching rashes develop
- Fever persists for a further three days after antibiotics are prescribed

TIMELY REFERRAL TO APPROPRIATE SITE OF CARE

- Children with life-threatening illness or those with features indicating high risk of illness should be referred to seek tertiary medical care immediately.
- Those with features indicating immediate risk of illness should be promptly referred to specialist paediatric care for further assessment.
- Children with features indicating low risk of illness can be cared for at home, with appropriate advice provided to parents.

Dr Zaw Lwin graduated from Institute of Medicine (1), Yangon, Myanmar, and became a member of Royal College of Paediatrics and Child Health, United Kingdom in 2003. Dr Lwin also holds diplomas in child health from Royal College of Paediatrics and Child Health, and Royal College of Physicians and Surgeons of Glasgow, United Kingdom.

Dr Lwin became a Fellow of Royal College of Physicians of Edinburgh, United Kingdom in 2010 and a Fellow of Academy of Medicine, Singapore in 2015. He has a special interest in paediatric emergency medicine and medical education.

STRIDOR, STERTOR AND SNORING

Clues to common airway problems in children

Dr Low Mei-Yi, Associate Consultant, Department of Otolaryngology, KK Women's and Children's Hospital

Transient, with little clinical significance, or heralding impending respiratory failure; stridor, stertor and snoring are symptoms that can indicate potentially life-threatening airway obstruction in children. These must be recognised as important clues to a wide range of conditions, congenital or acquired, which warrant otolaryngological assessment.

STRIDOR

Stridor is high-pitched, noisy breathing caused by turbulent airflow through a narrowed air passage. It can be classified as inspiratory (narrowing of the airway at the supraglottis or glottis), biphasic (narrowing of the subglottis or extrathoracic trachea), or expiratory (narrowing of the intrathoracic trachea).

Laryngomalacia

Laryngomalacia is characterised by excessive floppiness of the supraglottic larynx, which is sucked in during inspiration, and is a common cause of inspiratory stridor in children.
The condition accounts for 60 percent of all congenital laryngeal anomalies.

For a child with laryngomalacia, stridor presents in the first few weeks of life, peaks in severity at six months, and disappears by two years. It also worsens with crying and feeding, and improves when the child lies prone.

Most affected patients will grow out of the condition. However, children who present with concerning signs or symptoms such as desaturation, cyanosis, respiratory distress, failure to thrive, or apnoea should be referred for urgent tertiary assessment.

Laryngomalacia is believed to be due to immaturity of the laryngeal cartilages, and is possibly related to hypotonia and gastro-oesophageal reflux. Nasoendoscopy in a child with laryngomalacia reveals short aryepiglottic folds, a tubular epiglottis and prolapsing arytenoids (Figure 1).

In severe cases of laryngomalacia, supraglottoplasty may be required to relieve the obstruction.

Subglottic stenosis

Housed within the cricoid cartilage – the only complete non-expandable tracheal ring – the subglottis is the narrowest point of the paediatric airway, making it particularly vulnerable to abnormal narrowing, also known as stenosis.

Subglottic stenosis presents with biphasic stridor, and can be congenital (associated with underlying cricoid abnormalities) or acquired (most commonly secondary to intubation injury).

Children with congenital subglottic stenosis may present incidentally with difficult intubation. A child with an otherwise adequate but marginal airway may become compromised when there is mucosal oedema associated with a viral upper respiratory tract infection (URTI).

The condition is diagnosed by a microlaryngobronchoscopic finding of subglottic narrowing; management is individualised and dependent on the comorbidities of the patient and severity of the stenosis.

Grade 1 and 2 stenoses can be managed with repeat endoscopic balloon dilatation. Higher grade stenoses (Figure 2) are managed with open procedures such as laryngotracheal reconstruction with costal cartilage grafting. Cricotracheal resection is also a surgical option.

Figure 1. Features of laryngomalacia – tubular epiglottis and short aryepiglottic folds.

Figure 2. Endoscopic view of Grade 3 subglottic stenosis, appreciable through the vocal cords.

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Acute laryngotracheobronchitis

Acute laryngotracheobronchitis, also known as croup, is the most common cause of airway obstruction in children. The condition is usually of viral aetiology (parainfluenzae type 1, 2, 3) and typically affects children between six months to three years of age. Croup is characterised by inflammation and oedema of the airway, which result in the narrowing of the subglottis and trachea. Affected patients present with a fever and viral prodrome followed by hoarseness, biphasic stridor and a barking cough.

The diagnosis of croup is based on history, and clinical signs and symptoms. A steeple sign on an X-ray of the anterioposterior neck (Figure 3) is indicative of subglottic narrowing.

Management is dependent on the severity of respiratory distress, and may involve nebulised adrenaline, systemic corticosteroids or intubation. In cases of stridor refractory to medical treatment, or atypical or recurrent croup, microlaryngobronchoscopy is indicated to rule out underlying congenital airway abnormalities.

Foreign body aspiration

Foreign body aspiration is an airway emergency. It typically occurs in children three years and younger because of their underdeveloped abilities to chew and swallow, and their tendency to put objects into their mouths. A choking episode whilst eating, with subsequent stridor, wheezing, cyanosis or respiratory distress warrants immediate airway assessment.

Inspiratory and expiratory chest X-ray views (Figure 4) give valuable information on the site of the foreign body, and any resultant lung findings such as lung collapse, hyperinflation or infective changes. There should be a low threshold for ventilating bronchoscopy and removal of the foreign body.

Other common abnormal breathing noises that can indicate serious airway problems in children include stertor and snoring.

Figure 3. Steeple sign on anterioposterior neck X-ray, indicating subglottic narrowing.

STERTOR

Stertor is a low-pitched inspiratory snoring sound caused by nasopharyngeal or oropharyngeal obstruction whilst awake. Congenital causes can include choanal atresia, pyriform aperture stenosis, or nasolacrimal duct cysts. These may lead to respiratory distress in neonates, as babies are obligate nasal breathers until about two months of age.

Acquired causes of stertor include rhinitis with inferior turbinate hypertrophy, nasal foreign body, nasal polyps, peritonsillar or retropharyngeal abscess. These can present in children at any age.

A thorough nasal examination with nasoendoscopy, sometimes under general anaesthesia, is essential in the work up of babies and children who present with stertor. Management is directed at the individual condition.

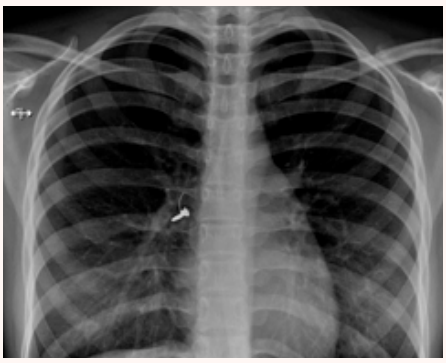

Figure 4. Chest X-ray showing an earring in right main bronchus of a child.

SNORING

Snoring is noisy breathing caused by turbulent airflow through a narrowed nasopharynx and/or oropharynx while sleeping. This symptom of sleep-disordered breathing can be indicative of a spectrum of disorders, such as primary snoring, upper airway resistance syndrome, and obstructive sleep apnoea (OSA) – the most severe of the spectrum.

Symptoms of OSA in children include sleep disruption, daytime sleepiness, behavioural and neurocognitive changes, enuresis and failure to thrive. The most common paediatric causes of OSA are adenotonsillar hypertrophy or palatal abnormalities. Children with syndromic craniofacial abnormalities such as Trisomy 21, Crouzon's syndrome or Pierre Robin syndrome are also at higher risk for OSA.

Management for sleep disordered breathing includes a detailed examination, including nasoendoscopy, to identify potential levels of airway obstruction. Polysomnography may also be helpful to grade the severity of OSA, and risk-stratify patients undergoing surgery.

Adenotonsillectomy is the mainstay of surgical management for children with clinical or sleep study-confirmed OSA, and is successful in over 60 percent of otherwise healthy children. It is one of the most common elective otolaryngological surgeries performed at KK Women's and Children's Hospital (KKH).

PAEDIATRIC AIRWAY MANAGEMENT TRENDS AT KKH

From 2009 to 2013, more than 500 paediatric patients underwent microlaryngobronchoscopy for airway evaluation at KKH. The top four indications included routine assessment in tracheostomised patients, evaluation of stridor, suspected foreign body aspiration and subglottic stenosis.

Laryngomalacia was the most common diagnosis amongst KKH patients undergoing microlaryngobronchoscopy for airway evaluation of stridor, and 159 of those patients subsequently underwent therapeutic interventions to manage airway obstruction.

KKH sees over 100 children a year for airway problems, and takes a multidisciplinary approach to evaluation and management, involving the otolaryngologist, anaesthetists, paediatricians, nurses, and the intensive care unit, where required.

The ENT Centre at KKH is a dedicated tertiary referral centre in the region for children's ear, nose and throat (ENT) problems. The centre sees the majority of complex paediatric ENT problems, and head and neck diseases in Singapore.

COMMON AIRWAY PROBLEMS IN CHILDREN

Possible causes, symptoms and management recommendations

	STRIDOR	STERTOR	SNORING
Definition	High-pitched, musical or noisy breathing that may be inspiratory, expiratory or biphasic	Low-pitched inspiratory snore-like sound whilst awake	Harsh, snorting sound whilst asleep
Region of anatomic obstruction	• Inspiratory stridor: supraglottis and glottis • Biphasic stridor: subglottis and extrathoracic trachea • Expiratory stridor: Intrathoracic trachea	• Nasopharynx or • oropharynx	• Nasopharynx or • oropharynx
Possible causes *(Note: This list is not exhaustive)*	**Congenital:** Laryngomalacia, bilateral vocal cord palsy, subglottic stenosis, laryngeal webs, subglottic haemangiomas **Acquired:** Croup, foreign bodies in airway, epiglottitis, acquired subglottic stenosis, recurrent respiratory papillomatosis	**Congenital:** Choanal atresia, pyriform aperture stenosis, nasolacrimal duct cysts **Acquired:** Rhinitis, foreign bodies in nose, peritonsillitis, retropharyngeal abscess, nasal polyps	**Congenital:** Craniofacial abnormalities, hypotonia, neurologic abnormalities **Acquired:** Adenotonsillar hypertrophy, inferior turbinate hypertrophy
Referral recommendation for GPs	The child should be referred for tertiary assessment if they present with symptoms or signs of respiratory distress as outlined below:		
	History: • Severity of obstruction • Progression of obstruction over time • Eating: feeding difficulties, aspiration, failure to thrive • Cyanosis, apparent life-threatening events • Sleep that is disturbed; suprasternal or chest retractions during sleep **Physical examination:** • Tachypnea, dyspnoea • Suprasternal or subcostal retractions • Failure to thrive • Dysmorphic features • Abnormalities or obvious sources of obstruction in the nose or oral cavity		**History:** • Choking episodes or apnoea during sleep • Disrupted sleep • Mouth-breathing • Enuresis • Neurocognitive or behavioural disturbance • Hypertension, cardiac failure **Physical examination:** • Adenotonsillar hypertrophy • Inferior turbinate hypertrophy • Craniofacial abnormalities

Dr Low Mei-Yi graduated from and completed a Master of Medicine in Otorhinolaryngology at National University of Singapore. She underwent her surgical training in otorhinolaryngology in Singapore, and completed a subspecialty fellowship in paediatric otorhinolaryngology at Royal Children's Hospital in Melbourne, Australia. Dr Low's interests include paediatric airway and ear diseases.

AESTHETICS OF THE POST-SURGICAL BREAST

Therapeutic mammoplasty in Asian women

Dr Lim Geok Hoon, Consultant, KK Breast Department; KK Women's and Children's Hospital

Breast cancer continues to be the commonest cancer affecting women worldwide and among Singaporean women, with an estimated 1,772 women in Singapore diagnosed with breast cancer yearly between 2009 and 2013[1].

As cancer treatment advances and breast cancer survival rates improve, the aesthetics of the post-surgical breast becomes an increasingly important consideration alongside its oncological management, hence the evolution of oncoplastic breast surgery.

The aim of oncoplastic breast surgery is to remove breast cancer in an oncologically safe manner, and concurrently achieve a good cosmetic outcome, with the aid of plastic surgery techniques. This surgical approach plays a key role in the psychosocial well-being of the patient with breast cancer.

Oncoplastic breast surgery is broadly divided into two types of techniques – volume replacement and volume displacement, the latter also known as therapeutic mammoplasty. The volume replacement technique is more common in Singapore, often used to reconstruct the breast post-mastectomy.

This is done using either breast implants, or by using autologous tissue such as latissimus dorsi (LD) muscle or the abdominal tissue by performing a deep inferior epigastric perforator flap (DIEP) etc.

WHEN TO CONSIDER THERAPEUTIC MAMMOPLASTY

Therapeutic mammoplasty is a surgical technique which aims to remove the cancer wholly and yet conserve the breast with good cosmetic outcome. It is particularly useful in a carefully selected subgroup of patients who have a large breast tumour and yet are keen for breast conservation.

This technique has been practiced in Western countries since the late 1990s, but its use locally has been dismally low. While there may be many reasons for this, therapeutic mammoplasty in Asian women with excellent outcome is definitely possible under skilled hands. Thus it should be carefully considered alongside more conventional surgical interventions for breast cancer, such as wide local excision (WLE), and mastectomy with or without reconstruction.

Wide local excision (WLE)

In WLE, the cancer and a margin of normal tissue around it is excised. Once the cancer has been removed, the edges of the surrounding wound are sutured together. This method usually suffices for most cases of small tumours while conserving the breast.

However, in the case of larger tumours, WLE may result in a poor cosmetic outcome and predispose the patient to a higher chance of positive surgical margins post-resection, and hence a higher re-excision rate.

It is estimated that up to 30 percent of women who undergo WLE will have a residual cosmetic deformity of the breast that may require surgical intervention[2].

Such deformities are often seen when more than 20 percent of the breast volume is removed[3], or when the tumour is located in cosmetically sensitive areas of the breast such as the upper, medial breast or the area behind the nipple[4].

Mastectomy and post-mastectomy breast reconstruction

In some cases, larger breast tumours may necessitate entire breast removal – known as mastectomy – which is not the most aesthetically pleasing outcome (Figure 1). While post-mastectomy breast reconstruction is an option for some patients, the procedure is not without complications. Breast reconstruction is associated with a longer hospital stay and operative time, increased cost and additional donor site morbidity, if the patient's own tissue is used.

Figure 1. Patient with a mastectomy for cancer in the left breast.

Therapeutic mammoplasty

Therapeutic mammoplasty can be a beneficial intervention for patients who present with larger tumours, as it maximises breast conservation while avoiding the disadvantages associated with WLE, mastectomy and post-mastectomy breast reconstruction.

Additionally, therapeutic mammoplasty has been shown to be capable of removing a larger tumour compared to WLE, with a higher incidence of achieving clear surgical margins and hence lowering the re-excision rate[5,6].

As the leading tertiary referral centre in Singapore for women's health, KK Women's and Children's Hospital manages about 300 to 400 patients with breast cancer every year, and is well-experienced in performing therapeutic mammoplasty for patients with breast cancer.

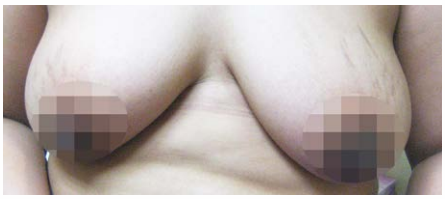

Figure 2. Preoperative photo of a patient with a slightly larger left breast and left breast cancer.

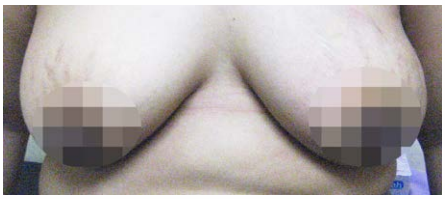

Figure 3. Postoperative photo of the patient after left therapeutic mammoplasty. The left breast cancer is removed, and greater symmetry of the breasts is achieved concurrently.

Disadvantages that can be associated with the technique include: higher incidence of wound complications, a small risk of nipple necrosis, and a longer – albeit well-concealed – scar. The shape, size and nipple position of the breast may also change.

In some cases, a longer operative time, and contralateral breast operation to ensure both breasts are symmetrical, may also be required. Preoperative counselling is hence essential to empower the patient to make an informed decision regarding the management of their breast cancer.

Many types of therapeutic mammoplasty exist, such as round block, vertical mammoplasty and Wise pattern, with a different indication for each. The type most suited to a patient depends on their breast size and degree of ptosis. However, therapeutic mammoplasty is generally most suited for patients with a reasonable breast size to begin with, or who desire a concurrent breast reduction. More specific eligibility criteria can be divided into patient and disease factors, as shown in Table 1 below.

TABLE 1: SPECIFIC ELIGIBILITY CRITERIA FOR THERAPEUTIC MAMMOPLASTY

PATIENT FACTORS	DISEASE FACTORS
1 Patients with asymmetrical breasts – with the tumour in the larger breast – who hope to achieve greater symmetry after removal of the tumour (Figure 2 and 3)	1 A large area of ductal carcinoma in situ
2 Patients who are unfit for neoadjuvant chemotherapy to shrink the large tumour – such as the elderly – or those with multiple comorbidities prohibiting the use of neoadjuvant chemotherapy	2 Multifocal lesions localised to a quadrant of the breast, requiring a quadrantectomy
3 Patients with droopy breasts who want to remove the tumour and also reduce breast size at the same time	3 Tumour types which are known to respond poorly to chemotherapy, such as lobular cancer, or large tumours which have shrunk minimally despite neoadjuvant chemotherapy

Specific contraindications for therapeutic mammoplasty include: patients with fatty breasts, and those who are heavy smokers or unfit for operation.

References

1. Singapore Cancer Registry. Annual Registry Report. Trends in Cancer Incidence in Singapore 2009 – 2013.
2. Clough KB, Cuminet J, Fitoussi A, et al. Cosmetic sequelae after conservative treatment for breast cancer: classification and results of surgical correction. Ann Plast Surg. 1998;41(5):471-481.
3. Bulstrode NW, Shrotria S. Prediction of cosmetic outcome following conservative breast surgery using breast volume measurements. Breast. 2001;10(2):124-126.
4. Gainer SM, Lucci A. Oncoplastics: techniques for reconstruction of partial breast defects based on tumor location. J Surg Oncol. 2011;103(4):341- 347.
5. Chakravorty A, Shrestha AK, Sanmugalingam N et al. How safe is oncoplastic breast conservation? Comparative analysis with standard breast conserving surgery. Eur J Surg Oncol. 2012 May;38(5):395-8.
6. Losken A, Dugal CS, Styblo TM, Carlson GW. A meta-analysis comparing breast conservation therapy alone to the oncoplastic technique. Ann Plast Surg. 2014;72(2):145-9.

Dr Lim Geok Hoon completed a fellowship in oncoplastic breast surgery at The Royal Marsden Hospital and St Bartholomew's Hospital in London, United Kingdom, as part of a Health Manpower Development Programme by Ministry of Health, Singapore.

One of the few local breast surgeons formally trained in oncoplastic breast surgery, Dr Lim was also the course director of the 1st Singapore Breast Oncoplastic Surgery Symposium (SBOSS), held in January 2015.

STAR-STUDDED PARTY RAISES FUNDS FOR DISADVANTAGED PATIENTS

In celebration of Singapore's jubilee year, KK Women's and Children's Hospital (KKH) held a soccer and carnival party for disadvantaged children under the hospital's care, and their families on Saturday, 13 June 2015.

Graced by Minister Grace Fu, Prime Minister's Office, Second Minister for the Environment and Water Resources and Second Minister for Foreign Affairs, the party raised a total of $140,000 towards the KKH Health Endowment Fund (KKHHEF).

This included donations of $50,000 each from Keppel Care Foundation and Mr Tan Kwang Hwee, Managing Director of Newsman Realty.

The children were also treated to a soccer clinic by soccer personality and former Singapore international footballer, Aleksandar Duric, and a SG50-themed games carnival run by volunteers from Keppel Corp.

The KKHHEF provides financial assistance for medical treatment to more than 500 underprivileged patients each year.

Beneficiaries of the KKHHEF include premature babies in need of intensive care, patients suffering from cancers and chronic conditions, vulnerable mothers, and children requiring therapy to cope with trauma and the stress of their illnesses.

As education and research are crucial to changing lives for the better, KKHHEF also supports education, research and disease prevention programmes that advance health for women and children.

Volunteers from Keppel Corp organised SG50-themed carnival games to entertain children and their families.

For more information about supporting women and child health through the KKHHEF, visit **www.kkh.com.sg/kkhhef**, email **development@kkh.com.sg** or contact Christine at **+65 6394 2329**.

Friendly football match between Professor Kenneth Kwek, CEO, KKH (left), and Aleksandar Duric, former Singapore international footballer (second from right).

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