### Module Title: Thoracic (Non-Cardiac) Conditions

**Date:** March 2013

#### Module Rationale and Competencies

A paediatric surgeon is required to have a thorough understanding of normal anatomy and physiology, as well as pathophysiology, investigations, differential diagnosis, operative and operative non-management of conditions (non-cardiac) thoracic conditions in children.

The Graduating Trainee will be able to:

- Diagnose and manage pathological conditions that pertain to the thoracic cavity and chest wall in children
- Communicate information to patients and their family about procedures, likely outcomes, and risks associated with surgery in ways that enable their participation informed decision making, including during antenatal counselling
- Select appropriate investigative tools
- Develop a management plan that takes into account the physical, social, cultural and psychological needs of the child
- Identify and manage risk
- Recognise when to refer patients to other professionals

#### Embryology

The embryology of the:

- Primitive foregut, including development of the airways, lungs, tracheo oesophageal separation
- Septum transversum and origin of the diaphragm.

#### Anatomy

Trainees should have thorough knowledge of the anatomy of the:

- Chest wall
- Trachea, bronchi and lungs
- Posterior mediastinum
- Diaphragm, including the structures which pass through it
- Thoracic inlet, including the structures that enter the thorax

#### Suggested Reading

Refer to Paediatric Surgery reading list available on the College website.

#### Learning Opportunities, Resources & Methods

Annual Scientific Congress of ANZAPS, Critical Appraisal Tasks, Directed Online Group Studies, MOUSE. Trainees should attend public and private outpatients and operating sessions at every opportunity and participate in the decision-making process as well as the operative procedure, peri-operative care and antenatal counselling. Compulsory courses.
### How this unit will be assessed

| Fellowship examination. Trainee evaluation forms and logbooks. Paediatric Anatomy and Paediatric Pathophysiology Examination. The level of competence in application of knowledge to clinical situations, judgment in case management, interpretation of investigations and clinical diagnosis will be assessed during day to day work and as a component of work-based assessments such as case based discussions, mini-CEX, MOUSE, 360°, quarterly trainee evaluation assessments, ward rounds and case presentations. Therefore this curriculum module should be read in conjunction with the appropriate template of Expected Performance Technical Expertise and Judgement Competencies. (SET in Paediatric Surgery Thoracic:non-cardiac) |

The use of the following key will define in which areas the trainee should have be competent in knowledge of basic paediatric surgery science and application of knowledge to relevant situations at the end of the SET level.

- **End EARLY SET**
- **End MID SET**
- **SENIOR SET**
### THORACIC (NON-CARDIAC) CONDITIONS

<table>
<thead>
<tr>
<th>Disease process</th>
<th>Pathology / Pathophysiology</th>
<th>Clinical assessment</th>
<th>Investigations</th>
<th>Principles of management</th>
<th>Operative management / competency</th>
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</table>
| **Empyema**     | List the causative organisms for empyema  
Describe the pathological sequence of events in the formation of empyema | Relate the clinical features to the underlying pathology in the development of empyema | Use and interpret appropriate imaging modalities, and their indications and limitations | Explain the management options (non-surgical and surgical), including the indications and timing of interventions  
Manage the condition | Open thoracotomy and debridement, thoracoscopic debridement of empyema |
| **Chest wall deformity** | Explain the different types of chest wall deformity, including Poland’s syndrome  
Describe the natural history of chest wall deformities and their physiological implications | Interpret examination findings | Indicate when additional imaging is required | Explain the management options (non-surgical and surgical), including the indications and timing of interventions  
Appropriately refer for subspecialty surgical or adjunct medical management if required. | Sternochondroplasty  
Nuss correction of pectus deformity |
| **Upper Gastrointestinal Burns**  
See also Trauma And Burns Module | Describe the Pathophysiology of different caustic and chemical injuries of the mouth oesophagus and stomach including natural history of non treated chemical ingestions injuries.  
Describe the symptoms and signs of caustic and chemical injuries to the upper GI and their complications including mediastinitis | Describe the symptoms and signs of caustic and chemical injuries to the upper GI and their complications including mediastinitis | Plan appropriate investigations both acute and long term. | List the principles of management of injuries related to the mechanism of burn injury and the severity. Discuss the role of the surgeons within the multidisciplinary team management to upper GI burns.  
Thoracotomy for approach to oesophagus and mediastinum.  
Upper GI diversion and stomas. | Thoracotomy for approach to oesophagus and mediastinum.  
Upper GI diversion and stomas.  
Upper GI endoscopy.  
Bronchoscopy  
Oesophageal replacement. |
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<td>Oesophageal stricture</td>
<td>Describe the congenital and acquired causes of oesophageal stricture including the damage from caustic injury</td>
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<tr>
<td>Intrathoracic masses</td>
<td>Describe the causes of intra thoracic masses in children Explain how the embryological theories of lung development relating to the spectrum of abnormalities seen with oesophageal duplications and bronchogenic cysts Describe the anatomy of the lungs and major airways</td>
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<tr>
<td>Congenital lung lesions</td>
<td>Describe the pathogenesis of the different types of congenital cystic lesions including long term sequelae. Discuss embryological theories for development of the spectrum of congenital cystic lung lesions.</td>
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<tr>
<td>Bronchiectasis</td>
<td>Understand the pathophysiology of bronchiectasis and the types described. Describe the causes, possible associations and the microbiology of the condition.</td>
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<tr>
<td>Palmar hyperhydrosis</td>
<td>Discuss hyperhydrosis and its cause</td>
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<tr>
<td>Spontaneous pneumothorax</td>
<td>Understand the pathophysiology of spontaneous pneumothorax and how this influences investigation and surgical treatment. List associated conditions.</td>
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<tr>
<td>Upper airway Obstruction</td>
<td>List and describe the causes of upper airway obstruction in children, including congenital anomalies, masses both intrinsic and extrinsic, and inhaled foreign bodies</td>
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<tr>
<td>Chylothorax</td>
<td>Describe symptoms and signs associated with a chylothorax.</td>
<td>List the causes of chylothorax especially noting conditions it may be associated with and timing of onset.</td>
<td>Describe appropriate investigations and imaging for a child with a chylothorax.</td>
<td>Develop a management plan for a child with a chylothorax. List the potential treatment options and discuss when they are appropriate. Discuss how the underlying cause may influence this plan.</td>
<td>Insertion of chest drain. Thoracotomy/thoracoscopy for a chylothorax.</td>
<td>Insertion of pleuro-peritoneal shunt. Ligation of the thoracic duct. Thoracotomy/thoracoscopy with pleurodesis and/or pleurectomy</td>
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