

MODULE TITLE:	ENDOCRINE	7-Nov-2016
DEVELOPED BY:	Jonathan Serpell	
REVIEWED BY:	Jonathan Serpell (2010) Michael Donovan, Senarath Edirimanne, Richard Harman, Brian Kirkby, Chris Pyke, Neil Wetzig (2013). Michael Donovan, Julie Howle (2016).	
Module Rationale and Objectives	<p>The general surgeon is expected to be able to investigate, assess and manage commonly occurring diseases of the endocrine glands and to be competent in accurately identifying conditions that require surgery, and those which are best treated by other means. They also expected to be able to recognise the need and appropriate time to refer such patients to other professionals.</p> <p>The graduating trainee will be able to:</p> <ul style="list-style-type: none"> ▪ describe common surgical pathologies of thyroid, parathyroid, adrenal, pancreas, and gut endocrine organs ▪ identify and recognise the symptoms and signs of these conditions ▪ describe and select appropriate diagnostic testing ▪ identify appropriate treatment options, and their indications and contraindications ▪ recognise, assess and treat any common thyroid, parathyroid, adrenal, pancreatic endocrine and neuro-endocrine tumour conditions likely to be encountered in consultative general surgical practice ▪ recognise which conditions to refer on to a specialised multidisciplinary service ▪ critically evaluate the advantages and disadvantages of different investigative modalities ▪ select appropriate investigative tools and monitoring techniques in a cost effective manner ▪ appropriately adjust the way they communicate with patients to accommodate cultural and linguistic differences ▪ communicate information to patients (and their family) about procedures, outcomes, and risks associated with surgery in ways that encourage their participation in informed decision making (consent) 	
Anatomy, Physiology, Pathology	<p>Trainees should have thorough knowledge of the normal embryology, anatomy, physiology, and pathology, of:</p> <ul style="list-style-type: none"> ▪ branchial arch development ▪ regional anatomy of neck ▪ surgical anatomy of the neck ▪ thyroid ▪ parathyroid ▪ adrenal ▪ pancreas/neuroendocrine system 	
Suggested Reading	<p>Society of Australian & New Zealand Endocrine Surgeons http://www.endocrinesurgeons.org.au/</p> <p>Trainees who are preparing to sit the Generic and Clinical Examinations need to refer to the recommended reading list on the RACS website at www.surgeons.org</p> <p>For the Fellowship examination, the following text is recommended:</p> <p>(1) Textbook of Endocrine Surgery (ISBN 9789351528067), 3rd edition by O. Clark, Q-Y Duh et al.</p> <p>This is an excellent reference textbook on Endocrine Surgery.</p> <p>Trainees are expected to keep abreast of the current literature, including textbooks, journal articles, consensus guidelines and other on-line resources.</p>	
Learning Opportunities and Methods	<p>If state-based and/or local hospital courses/meetings are available, trainees are strongly advised to avail themselves of these opportunities. This also includes practising procedures on simulation equipment where applicable.</p> <p>Trainees are encouraged to present their research at national and/or accredited regional training days, in order to fulfil the research requirement.</p>	
How this module will be assessed	<p>The Generic and Clinical Examinations; Fellowship examination (written and viva voce sections); Trainee evaluation forms and logbooks; SEAM (where applicable).</p>	
Definitions	<p><i>Operative Management - Knows:</i> Trainees are required to be familiar with the indications, benefits and limitations of the procedure; trainees should be able to describe the relevant operative techniques involved in performing the procedure; trainees are encouraged to at least observe and preferably assist in these procedures.</p> <p><i>Operative Management - Does:</i> In addition to the above, trainees must be competent at performing the procedure.</p>	

SET LEVEL	MEDICAL EXPERTISE	JUDGEMENT / CLINICAL DECISION MAKING			TECHNICAL EXPERTISE	
	ANATOMY PHYSIOLOGY PATHOLOGY	CLINICAL ASSESSMENT	INVESTIGATIONS	PRINCIPLES OF MANAGEMENT	OPERATIVE MANAGEMENT - KNOWS -	OPERATIVE MANAGEMENT - DOES -
Multinodular goitre, thyroiditis, thyrotoxicosis, thyroglossal cyst <i>See Head & Neck Module</i>						
Early SET	<ul style="list-style-type: none"> Normal and abnormal anatomy, embryology histology of the thyroid gland, including thyroglossal duct cyst Natural history and causes of multinodular goitre, including retrosternal and recurrent goitres and thyroiditis, including Hashimoto's and subacute thyroiditis Thyrotoxicosis - Graves, toxic adenoma, toxic MNG Physiology of thyroid hormone and iodine metabolism including pathophysiology of hyper and hypothyroidism 	<ul style="list-style-type: none"> Take a history of thyroid disorders including the assessment by history of thyroid function Conduct a thorough thyroid gland examination and other features of neck examination Describe clinical features of thyroglossal cyst 	<ul style="list-style-type: none"> Review the relevance of: <ul style="list-style-type: none"> thyroid function (TSH, T4, T3) thyroid antibody tests, ESR, CRP thyroglobulin imaging (U/S, Nuclear medicine scans, CT) fine needle aspiration cytology +/- repeat FNAC understand the place of laryngoscopy indirect laryngoscopy 			
Mid SET	<ul style="list-style-type: none"> Understand principles of nerve monitoring 	<ul style="list-style-type: none"> Perform indirect laryngoscopy 	<ul style="list-style-type: none"> FNA thyroid Laryngoscopy <ul style="list-style-type: none"> indirect flexible 	<ul style="list-style-type: none"> Summarise indications for surgery versus medical therapy versus radioiodine treatment for hyperthyroidism Describe indications for surgery and preoperative assessment multinodular goitre Manage postoperative complications including hypocalcaemia, thyroid storm, airway compromise, post-operative bleeding and infection, recurrent laryngeal nerve palsy, external branch of superior laryngeal nerve palsy Outline preoperative management hyperthyroid patient 	<ul style="list-style-type: none"> Total Thyroidectomy Autotransplant parathyroid 	<ul style="list-style-type: none"> Hemithyroidectomy Tracheostomy
Late SET				<ul style="list-style-type: none"> Understand role of office ultrasound 	<ul style="list-style-type: none"> Sternal split Re-operative thyroid surgery Sistrunk operation: See Head & Neck Module Principles of intraoperative neuromonitoring 	<ul style="list-style-type: none"> Hemithyroidectomy Total Thyroidectomy Autotransplant parathyroid

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Thyroid tumours ▪ benign ▪ malignant						
Early SET	<ul style="list-style-type: none"> - Discuss the: - natural history and causes benign and malignant thyroid tumours - histopathological types of thyroid cancer - inheritance patterns, genetic and molecular implications of various malignancies - spectrum of sporadic versus MEN I & II syndromes - presentation and natural history ▪ Detailed knowledge (levels I to VII lymph nodes of neck)	▪ Review the clinical features in the history and the examination findings	▪ Review the relevance of: <ul style="list-style-type: none"> - medical imaging (U/S, Nuclear Medicine scans, CT, PET scanning) - fine needle aspiration cytology (Bethesda classification) 	▪ Understand the differences between Total and Hemithyroidectomy and a basic understanding of the risks of thyroid surgery and the place of radioactive iodine therapy		
Mid SET		▪ <i>See also multinodular goitre</i>	▪ <i>See also multinodular goitre</i>	▪ Summarise: <ul style="list-style-type: none"> - indications for surgery for benign tumours - role of hemithyroidectomy for microcarcinoma - role of total thyroidectomy for malignancy - role of post-operative radioiodine ablation for thyroid cancer - principles of neck dissection for thyroid cancer - manage postoperatively thyroid hormone replacement - manage post-operative complications, including bleeding hypocalcaemia, thyroid storm, respiratory and tracheal problems, post-operative, and infection, recurrent laryngeal nerve palsy, external branch of superior laryngeal nerve palsy 	▪ <i>See also multinodular goitre</i>	▪ <i>See also multinodular goitre</i>

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Thyroid tumours (continued)						
<ul style="list-style-type: none"> ▪ benign ▪ malignant 						
Late SET					<ul style="list-style-type: none"> ▪ Selective lateral lymph node dissection (levels II to V) ▪ Central compartment node dissection (level VI and VII) ▪ Principles of intraoperative neuromonitoring ▪ Principles of surgical management of locally advanced thyroid cancer ▪ <i>See also multinodular goitre</i> 	<ul style="list-style-type: none"> ▪ <i>See also multinodular goitre</i>
Parathyroid tumours and hyperplasia						
Early SET	<ul style="list-style-type: none"> ▪ Understand: <ul style="list-style-type: none"> - normal and abnormal anatomy, embryology histology and physiology of the parathyroids, including calcium homeostasis, parathormone assays, vitamin D homeostasis and familial hypocalciuric hypercalcaemia - pathological spectrum and natural history of primary, secondary and tertiary hyperparathyroidism – including adenoma and hyperplasia and carcinoma - spectrum of sporadic versus MEN I and II syndromes - presentation and natural history 	<ul style="list-style-type: none"> ▪ Review the clinical features in the history: <ul style="list-style-type: none"> - hyperparathyroidism 	<ul style="list-style-type: none"> ▪ Importance of biochemical diagnosis ▪ Carry out serum and urine biochemical diagnosis and exclude other causes of hypercalcemia ▪ Review the relevance of medical imaging (U/S, Nuclear medicine scans, CT) ▪ Understand the role and interpretation of Ultrasound and sestamibi scans, MRI, CT; selective venous sampling, preoperative localisation ▪ Understand the associated general medical conditions including complications of hyperparathyroidism and chronic renal failure 	<ul style="list-style-type: none"> ▪ Indications for surgery ▪ Understand the differences associated with parathyroid exploration in the different situations of primary, secondary, tertiary, and reoperative hyperparathyroidism 		
Mid SET	<ul style="list-style-type: none"> ▪ Knowledge of anatomical sites of ectopic parathyroid glands 	<ul style="list-style-type: none"> ▪ Understand the role of indirect laryngoscopy 		<ul style="list-style-type: none"> ▪ Summarise: <ul style="list-style-type: none"> - non-surgical management of hypercalcemia - management of post-operative hypocalcemia and hungry bone syndrome - complications of surgery - implications of failed parathyroid exploration 	<ul style="list-style-type: none"> ▪ Parathyroidectomy – open and minimally invasive (MIP) ▪ Neck exploration + frozen section including excision adenoma, 31/2 gland excision, total parathyroidectomy +/- autotransplantation 	

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Parathyroid tumours and hyperplasia (continued)						
Late SET	<ul style="list-style-type: none"> Discuss the likely sites of finding parathyroid glands at neck exploration 				<ul style="list-style-type: none"> Re operative parathyroid surgery Cervical thymectomy 	
Pancreatic endocrine tumours and hyperplasia, neuro-endocrine tumours						
Early SET	<ul style="list-style-type: none"> Discuss the: <ul style="list-style-type: none"> spectrum of sporadic versus MEN I and II syndromes -presentation and natural history pathophysiological effects of neuroendocrine hormone excess pharmacology of somatostatin analogues Outline general pathology of neuroendocrine tumours Detailed understanding of normal, abnormal anatomy, histology and pathology of the endocrine pancreas Syndromes due to neuroendocrine metastasis Paraneoplastic syndromes 	<ul style="list-style-type: none"> Review the clinical features in the history and the examination findings 	<ul style="list-style-type: none"> Appropriate serum and urine biochemical diagnosis Review the relevance of: <ul style="list-style-type: none"> medical imaging Preoperative endoscopy +/-endoscopic ultrasound Review general medical associated conditions 			
Mid SET			<ul style="list-style-type: none"> Assessment of a pancreatic mass 	<ul style="list-style-type: none"> Summarise: <ul style="list-style-type: none"> principles of preoperative optimisation medical conditions principles of pancreatic surgery intraoperative ultrasound principles of palliation neuroendocrine syndromes (operative, medical, radiological) 	<ul style="list-style-type: none"> Pancreatic tumour enucleation, distal pancreatectomy, pancreatoduodenectomy 	<ul style="list-style-type: none"> Bowel resection for small bowel tumours (carcinoid) Liver biopsy
Late SET					<ul style="list-style-type: none"> Non-anatomical and anatomical liver resection 	

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Adrenal gland functional abnormalities and tumours, and retro peritoneal tumours						
Early SET	<ul style="list-style-type: none"> ▪ Normal and abnormal anatomy, embryology, histology and physiology the adrenal gland ▪ Discuss the: <ul style="list-style-type: none"> - spectrum of sporadic versus MEN I and II syndromes - presentation and natural history - pathophysiological effects of adrenal cortical or medullary hormone excess 	<ul style="list-style-type: none"> ▪ Review the clinical features in the history and the examination findings including those for: <ul style="list-style-type: none"> - Cushing's syndrome - Conn's Syndrome - Sex Hormone excess - Catecholamine excess 	<ul style="list-style-type: none"> ▪ Review: <ul style="list-style-type: none"> - screening tests - definitive tests - localising tests ▪ Discuss the principles of stimulation and suppression tests ▪ Carry out serum and urine biochemical diagnosis ▪ Review general medical associated conditions 			
Mid SET			<ul style="list-style-type: none"> ▪ Review the relevance of medical imaging for localising 	<ul style="list-style-type: none"> ▪ Summarise/ implement: <ul style="list-style-type: none"> - preoperative optimisation/ blockade of medical condition - assessment for suitability for laparoscopic approach versus open approach - postoperative hormone deficiency syndromes and their management 	<ul style="list-style-type: none"> ▪ Adrenalectomy, including open and laparoscopic anterior, posterior, lateral and abdominal 	
Late SET					<ul style="list-style-type: none"> ▪ Retroperitoneal lymph node dissection and resection of adrenal tumours 	