Sepsis and other critical conditions require informed and decisive action on the part of the surgeon. This module identifies the key areas in which trainees are expected to have expertise in order to be able to minimise infection risks and consequences in critically ill or compromised patients and to respond promptly and appropriately as the need for assessment and management of sepsis in such patients arises. The graduating trainee will be able to:

**Pathology of sepsis:**
- describe common surgical pathologies of sepsis in specific organs or regions
- describe infectious pathologies likely to be associated with surgically treated diseases
- describe infectious pathologies associated with medically complex, malnourished and immune suppressed patients

**Prophylaxis of sepsis:**
- display well informed, evidence based team leadership in prophylaxis and management of sepsis in critically ill or compromised patients
- anticipate and aim to prevent the onset of sepsis and sepsis related complications in surgical patients
- describe mechanisms for limiting the development and spread of infectious diseases, especially multiresistant organisms, among critically ill and compromised surgical patients
- describe evidence-based prophylaxis against development of peri-surgical sepsis

**Recognition and diagnosis of sepsis and sepsis syndromes:**
- apply the CCISIP principles to identify and recognise the symptoms and signs of these conditions
- describe and select appropriate diagnostic testing
- select appropriate investigative tools and monitoring techniques

**Management planning and treatment:**
- identify appropriate treatment options, and their indications and contraindications
- determine the appropriate priorities of care and level of care for patients affected by sepsis
- demonstrate awareness of the basic pharmacology and principles of antibiotic based therapeutics
- effectively manage septic complications of operative procedures and the underlying disease process
- identify the likely causative factor(s) of a patient's critical illness and implement management accordingly
- prioritise, initiate and coordinate the timely management of critically ill patients
- accurately identify the risks, benefits and mechanisms of action of various treatment modalities and interventions

**Ethics and Professional Communications:**
- understand the importance of a multidisciplinary approach to the management of critically ill patients
- recognise the importance of effective communication with other professionals and recognise the need for timely referral and for timely response to requests for surgical review and surgical treatment
- 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**

Trainees should have thorough knowledge of the, anatomy, microbiology, physiology, and pathology, of:
- organ-specific sepsis
- Systemic Inflammatory Response Syndrome (SIRS)/Multiple Organ Dysfunction Syndrome (MODS)
- system specific dysfunction (e.g. renal impairment)
- co-morbidities that may alter management and/or adversely affect outcome

**Suggested Reading**


For the Fellowship examination, there are no prescribed texts. Trainees are expected to keep abreast of the current literature, including textbooks, journal articles, consensus guidelines and other on-line resources.

**Learning Opportunities and Methods**

Therapeutic Guidelines for surgical sepsis prophylaxis and for antibiotic therapy of surgical sepsis (available on internet or on most hospital intranets).
Skills courses including RACS CCISIP, EMST courses.
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.
Trainees are encouraged to present their research at national and/or regional training days, in order to fulfil the research requirement.

**How this module will be assessed**

The Generic and Specialty-Specific Science Examinations and the Clinical Examination; Fellowship examination (written and viva voce sections); Trainee evaluation forms and logbooks; DOPS and mini-CEX (where applicable).

**Assumed Knowledge**

- Normal organ physiology
- Classification and characteristics of micro-organisms
- Local and systemic immune responses
- Physiological responses to pathogens
- Microbiology of organisms associated with major surgical sepsis including especially surgically relevant cocci, bacilli, clostridia, yeasts and fungi
### Assumed Knowledge (continued)

- Laboratory investigation methods and indications for same
- Pharmacology, prescribing and indications for appropriate prophylactic and therapeutic use of for use of antibiotics in the prophylaxis and therapy of surgical sepsis
- Principles and practice of routines mitigating against spread of colonisation and invasive sepsis among surgical patients (e.g. 5 moments of hand hygiene)
- Principles and practice of antibiotic stewardship in surgical practice

### Definitions

**Operative Management - Knows:** 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.

**Operative Management - Does:** In addition to the above, trainees must be competent at performing the procedure.
### Critically ill surgical patient e.g.:
- severe pancreatitis, anastomotic leak
- strangulated small bowel / ischaemic colon / perforated small bowel / colon (see also Emergency Surgery Module)
- massive haemorrhage (see also Emergency Surgery Module)
- Severe cholangitis (See also Upper GI & HPB - Hepatic, Pancreatic & Biliary Module)

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| SET1-2 (Early) | • Recognise the spectrum of pathologies responsible for critical illness  
• Explain the pathophysiology and consequences of:  
  - SIRS  
  - MODS  
  - Adult Respiratory Distress Syndrome  
  - shock | • Identify the patient at risk of becoming critically ill  
• Recognise the clinical features of a critically ill patient and life threatening conditions  
• Identify and describe the clinical features of the different causes of shock | • Appropriately select and coordinate multimodal assessment as required  
• Review and interpret available data (patient, ICU, research)  
• Identify and describe scoring systems in relation to critically ill patients (e.g. SOFA, APACHE II)  
• Organise multidisciplinary management  
• Identify the appropriate level of care for the patient  
• Organise resuscitation  
• Coordinate safe transfer of patient  
• Employ appropriate monitoring to assess response to resuscitation  
• Outline the role of pharmacological agents and their complications (not sure here whether more information is required e.g. pressor agents, antibiotics etc.)  
• Cricothyroidotomy/tracheostomy | • Establish and maintain emergency airway  
• Needle thoracostomy/intercostal chest drain  
• Establish definitive emergency vascular access - central and peripheral |

| SET3-4 (Mid) | | | • Discuss the procedural details of definitive surgical management where indicated  
• Explain the role and indications for advanced organ and system support:  
  - cardiovascular  
  - respiratory  
  - renal |

| SET5+ (Late) | | | |

### Gangrene/necrotising fasciitis

*See Skin & Soft Tissue Module*

### Tetanus

| SET1-2 (Early) | • Discuss the incidence and describe pathogenesis including microbiology  
• Identify the clinical manifestations  
• Classify the spectrum of presentation | | • Wound debridement |
<p>| SET3-4 (Mid) | | | • Coordinate multidisciplinary care |</p>
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**Subphrenic/pelvic/ intra-abdominal abscess**

**SET1-2 (Early)**
- Describe the anatomy of abdominal and pelvic cavity
- Describe the various forms of abscess
- Classify the spectrum of presentation, including the clinical signs of sepsis and clinical presentations pertaining to abscesses in various sites in the abdomen
- Select and interpret blood tests, microbiology and imaging investigations
- Review open/ percutaneous drainage procedures
- Discuss therapeutic and prophylactic role of antibiotics, including dosage of common antibiotics

**SET3-4 (Mid)**
- Identify and describe the role for laparotomy/laparostomy, minimally invasive techniques
- Discuss the procedural details of treatment, including possible complications and how to deal with them
- Transrectal drainage
- Laparotomy/ laparostomy/minimally invasive techniques for drainage of complex abscesses

**SET5+ (Late)**

**Psoas abscess**

**SET1-2 (Early)**
- Describe pathogenesis, causative organisms, and related disease
- Take an appropriate history and perform a focused examination
- Select and/or interpret diagnostic/ interventional imaging
- Interpret results of microbiological specimens
- Review open/ percutaneous drainage procedures
- Discuss the role of antibiotic therapy

**SET3-4 (Mid)**
- Discuss the procedural details of open drainage
- Trans/ Retroperitoneal drainage

**SET5+ (Late)**

**Intra-abdominal sepsis/peritonitis**
*See also Abdominal Wall Module*
*See also above: Subphrenic/pelvic/ intra-abdominal abscess*

**SET1-2 (Early)**
- Discuss pathogenesis, causative organisms, and related disease
- Perform a focused clinical examination
- Select and/or interpret diagnostic/ interventional imaging
- Interpret microbiological results
- Discuss the indications for non-surgical and surgical management
- Discuss indications for laparostomy and delayed closure
- Describe the principles of open/ percutaneous and minimally invasive drainage procedures where appropriate

**SET3-4 (Mid)**

**SET5+ (Late)**
- Laparostomy
- Laparotomy for sepsis control
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**The immuno-suppressed patient**  
*See Transplantation Module*

**SET1-2 (Early)**  
- Discuss the basis of humoral and cellular immunity and the factors that modify immunity  
- Identify the symptoms and signs suggesting sepsis and/or impending decompensation in an immuno-suppressed patient

**SET3-4 (Mid)**

**SET5+ (Late)**

**HIV/AIDS and other atypical infections including TB**  
*See also above: The immuno-suppressed patient*

**SET1-2 (Early)**  
- Describe the pathophysiology of immune suppression as it relates to HIV/AIDS  
- Explain the progression of disease

**SET3-4 (Mid)**

**SET5+ (Late)**

**The splenectomised patient**  
*See also above: The immuno-suppressed patient*

**SET1-2 (Early)**  
- Discuss the anatomy and physiological role of the spleen  
- Outline the role of the spleen in certain haematological disorders such as hereditary spherocytosis and idiopathic thrombocytopenic purpura  
- Outline the role of the spleen in certain infectious conditions such as infectious mononucleosis and malaria

**SET3-4 (Mid)**

**SET5+ (Late)**

- Insertion of central venous access with management

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**Post transplantation patients**

*See Transplantation Module*

**Nutritional support**

**SET1-2 (Early)**
- Describe:
  - components of nutrition and their functions
  - normal fluid, electrolytic and other nutritional requirements
  - specific nutritional demands associated with different pathologies
  - complications associated with nutritional replacement
  - how nutrition influences outcome
- Identify the patient at risk of nutritional deficiencies
- Recognise the symptoms and signs related to nutritional deficiencies
- Identify patients who have specific nutritional requirements
- Select and interpret appropriate laboratory tests to assess nutrition
- Appraise the role of nutritional support in the management of surgical pathologies
- Coordinate multidisciplinary approach to management
- Differentiate the various routes for nutritional support

**SET3-4 (Mid)**
- Select and interpret appropriate laboratory tests to formulate nutritional support
- Explain the indications for enteral and parenteral nutritional routes and the associated complications
- Monitor response to nutritional support and adjust accordingly
- Describe techniques to establish routes for administering nutrition
- Understand pathophysiology of re-feeding syndrome

**SET5+ (Late)**
- Feeding gastrostomy/jejunostomy (open, endoscopic, and laparoscopic)
- Vascular access for nutrition (including surgical and radiological implantable and tunnelled devices)

**Other medical system disease**

**SET1-2 (Early)**
- Recognise the impact on effective management of surgical patients of comorbidities e.g. cardiac, respiratory, renal, hepatic, endocrine, CNS, obesity
- Quantify and classify the risk factors of comorbidities
- Classify the patient according to ASA grading system and be able to accurately determine patient status
- Coordinate (and lead) multidisciplinary teams

**SET3-4 (Mid)**

**SET5+ (Late)**
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<td>SET1-2 (Early)</td>
<td>• Describe:</td>
<td>• Identify the patient likely to have pain</td>
<td>• Select and interpret investigations to determine the cause of pain</td>
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<td>- pathophysiology of acute pain</td>
<td>- Recognise and assess pain using a scoring system</td>
<td>- Recognise abnormal behaviour in response to pain</td>
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**Acute pain control**

**SET3-4 (Mid)**

**SET5+ (Late)**

**Patients on specific medications: Anticoagulant, Immunomodulators, Oncological agents**

**SET1-2 (Early)**

• Recognise the impact of various pharmacological agents on different patients

• Order and interpret appropriate investigations as required

• Select and adjust surgical practice according to risk

• Coordinate multidisciplinary teams

**SET3-4 (Mid)**

**SET5+ (Late)**