COLLEGE OF INTENSIVE CARE MEDICINE
OF AUSTRALIA AND NEW ZEALAND

Syllabus for the Second Part Examination in Paediatric Intensive Care Medicine

First Edition

Foreword

This is the first edition of the Syllabus for the Second Part Paediatric examination in paediatric intensive care medicine. It has evolved from the College training document T-36 (Competencies, Learning Opportunities, Teaching and Assessments for Training in Paediatric Intensive Care Medicine), and incorporates the experience and knowledge gained since the publication of the current version.

The structure has changed to a more systems-based approach, with greater detail provided on which conditions and topics are examinable. Domains of practice are categorised into “Levels of Understanding” to further guide candidates as to the amount of detail expected. Crucially, the syllabus has also been more closely aligned with the College graduate outcomes and the overall training program. When read in conjunction with the examination reports and past papers, it is hoped that it will provide trainees, tutors, and examiners with an improved guide as to the desired breadth and depth of knowledge required for success in the Second Part Paediatric examination.

Intensive care medicine is a rapidly changing speciality, and this document can never be complete. The intent is to review it regularly and it will continue to evolve. The College of Intensive Care Medicine encourages trainees to update and maintain the currency of their clinical knowledge.

Finally, the strengths and value of this document could not have been achieved without the contribution of those involved; Candidates who have sat the CICM Second Part Paediatric examination, past and current CICM Second Part Paediatric Examiners, and all those listed within this document.

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Contributors

CICM acknowledges the valued contributions made in the development of the Syllabus for the Second Part examination in paediatric intensive care medicine (first edition).

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1 Introduction

1.1 The Second Part examination in paediatric intensive care medicine

The Second Part Paediatric examination is a summative assessment of knowledge, skills, behaviours, and capabilities in paediatric intensive care medicine. The examination is completed in Phase 2 of training, and trainees are eligible to sit the exam following the completion of 12 months of core training in intensive care. It comprises three components: short answer questions (SAQ's), oral vivas and clinical cases.

Successful completion of the Second Part Paediatric examination is required to progress to Phase 3 (the transition year) of training. This provides evidence that trainees entering Phase 3 have the knowledge, skills, and capabilities to practice safely and effectively as a Phase 3 (transition year) trainee, who is progressing towards practice as an intensive care medicine specialist.

Specialist international medical graduates may be required to undertake the Second Part Paediatric examination as part of the pathway to specialist recognition in Australia or Aotearoa New Zealand.

1.2 Connection with the CICM training program curriculum

Preparation for the Second Part Paediatric examination supports achievement of the CICM graduate outcomes in intensive care medicine. Successful completion of the Second Part Paediatric examination provides evidence of progress towards achievement of these outcomes in these domains; medical expert, communicator and collaborator, health advocate, leader and manager, scholar and professional. These domains may be assessed in any or all of the three components of the examination.

1.3 Syllabus purpose

The purpose of the syllabus for the Second Part examination in paediatric intensive care medicine is:

1. To provide transparency for examiners, candidates, supervisors of training and other CICM Fellows regarding assessable knowledge, skills, and capabilities.
2. To provide the basis for blueprinting the examination, which supports a comprehensive and consistent approach to assessment.
3. To enable comprehensive and effective feedback for candidates on performance in the examination.

1.4 Syllabus structure

The syllabus is divided into Domains of Practice, reflecting the CICM graduate outcomes. Each Domain is further divided into subjects. Subjects comprise both "conditions" – specific pathophysiological processes – and "topics" – concepts relevant to the subject.

1.5 Levels of Understanding

Expectations of candidates understanding of conditions and topics in the Medical Expert domain will differ based on relevance and importance in paediatric intensive care practice.

L1
These conditions and topics are core areas of clinical practice relevant to paediatric intensive care medicine and are considered essential knowledge. Detailed knowledge and comprehension of the principles and facts that relate to these areas will be expected, as well as the ability to apply and relate facts, principles, and concepts, analyse and appraise information provided, and create and justify rationales for approaches to clinical and non-clinical cases.

L2
These conditions and topics are significant and relevant to paediatric intensive care medicine and are considered important knowledge. An understanding of the key concepts and facts that relate to these areas is expected, although with less detail than required for L1 conditions and topics.

The distinction between L1 and L2 conditions and topics is reflected both in the level of expected knowledge, and the frequency with which the condition or topic will be examined.

Expected Knowledge for each domain of practice is given below the conditions and topics lists. This may be divided into sections for the L1 and L2 lists.

Frequency of Examination Questions on L2 conditions and topics will comprise no more than 30% of the written paper in total, and L2 conditions and topics will not form the primary focus of individual Vivas.

1.6 Recommended resources

Candidates are encouraged to draw on a variety of resources to support preparation for the Second Part Paediatric examination, including reviewing the CICM guidelines and statements relating to clinical care, as the content of these are assessable in the Second Part Paediatric examination. The recommendations outlined below are not an exhaustive list and should be taken as an indication of the type of resources candidates should draw on. For conditions and topics in the Syllabus where expected knowledge includes supporting evidence, candidates will be expected to have a summary understanding of the relevant literature but will not be required to answer questions on specific clinical trials.

Textbooks:

- Oh's Intensive Care Manual
- Roger's Textbook of Pediatric Intensive Care
- Critical Heart Disease in Infants and Children.
- Data Interpretation in Critical Care Medicine
- Statistical Methods in Anaesthesia and Intensive Care,
- Major Critical Care Journals subscribed by CICM (refer to the CICM Library)

CICM Resources:

- Examination Reports and Past Papers
- Professional Documents

- Trainee Education Resources
- Indigenous Health Resources

Other Professional Organisational Resources:

- ANZICS statement on Death and Organ Donation
- ATLS/ACLS Guidelines
- ANZCOR Guidelines
- Brain Trauma Foundation Guidelines

Many candidates also find educational websites and podcasts to be useful supplements for exam preparation.

1.7 Glossary

For each of the conditions, topics, procedures, and therapies described within the syllabus, candidates may be asked to:

Critically evaluate	Provide and explain the evidence available relating to a topic.
Outline	Provide a summary of the important points.
List	Provide a list.
Compare and contrast	Provide a description of similarities and differences.
Assessment	Generic term that implies determining an underlying diagnosis, encompassing history, clinical examination, and relevant investigations.
Management	Generic term that implies determining an overall management plan, encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment.
Discuss	Explain the underlying key principles. Where appropriate, this should include controversies and/or advantages and disadvantages.
Explain	Make plain or known in detail.

2 Domains of Practice

2.1 Medical Expert

2.1.1 Structure and Process

L1 **Topics** • Transport of the critically ill child • Rapid Response Systems / Critical Care Outreach • Principles of infection control • Early mobilisation and ICU liberation	**L2** **Topics** • ICU design and organisation • Role of clinical information systems, other expert systems. • Workplace culture e.g., burnout, fatigue (management and prevention) • Role of team-based health care in ICU • Pandemic and major incident Planning and response
For each of the above topics expected knowledge will include: • Principles and practice / implementation • Relevant guidelines and evidence • Controversies and risks	

2.1.2 Decision Making

L1 **Topics** • Clinical assessment of the critically ill child • Severity scoring and outcome prediction • Treatment limitation / end of life care • Principles of medical ethics and application of ethical principles to clinical practice	**L2** **Topics** • Principals of critical thinking/clinical reasoning
For each of the above topics expected knowledge will include: • Principles and practice • Relevant guidelines and evidence • Controversies and risks	

2.1.3 Sepsis and Infections

L1

Conditions

- Sepsis and Septic shock
- Multiple organ dysfunction syndrome
- Common and emerging bacterial, viral and fungal infections in children requiring ICU admission
- Infections in congenital and acquired immunodeficiency
- Healthcare-associated infections
- Uncommon infections with specific ICU considerations. Including, but not limited to, necrotising soft tissue infection, cerebral malaria, tuberculosis, endocarditis, tetanus, melioidosis, infant botulism

Topics

- Antimicrobial use in the ICU
- Infection Control

For each of the above **conditions** expected knowledge will include:

- Epidemiology
- Aetiology
- Pathophysiology and clinical course
- Assessment encompassing history, clinical examination, and relevant investigations
- Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment
- Complications and known sequelae
- Relevant guidelines and evidence

Candidates should be able to:

- Apply knowledge to intensive care clinical scenarios
- Perform an appropriate clinical assessment
- Analyse and synthesise information from a clinical assessment and investigations
- Develop an evidence-based management plan tailored to patient needs

For each of the above **topics,** expected knowledge will include:

- Principles and practice
- Relevant guidelines and evidence
- Controversies and risks

2.1.4 Cardiovascular Intensive Care

L1	L2
Conditions • Congenital heart disease • Shock • Cardiac arrest • Heart failure • Pulmonary hypertension • Hypertensive Crisis • Childhood acquired heart disease • Cardiac arrythmias • Vena cava obstruction syndromes **Topics** • Haemodynamic monitoring • Interpretation of the electrocardiogram • ECMO support in cardiac disease • Cardiopulmonary resuscitation • Post-resuscitation care	**Conditions** • Pericarditis • Thrombotic disease • Cardiac transplantation
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology • Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs For each of the above **L1 topics,** expected knowledge will include:	For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs For each of the above **L2 topics,** expected knowledge will include: • Principles and practice • Controversies and risks

• Relevant anatomy • Principles and practice • Interpretation • Relevant guidelines and evidence • Controversies and risks	

2.1.5 Respiratory Intensive Care

L1	L2
Conditions • Congenital anomalies of the airways and lungs • Respiratory failure • Acute lung injury and acute respiratory distress syndrome • Acute severe asthma • Pneumonia • Airway obstruction • Laryngo/bronchomalacia • Vocal cord palsy • Air leak syndromes • Obstructive sleep apnoea • Pulmonary embolism (clot, fat and other) • Pulmonary haemorrhage • Pleural disease including broncho- pleural fistula • Chylothorax **Topics** • Airway management • Respiratory monitoring • Interpretation of arterial blood gases • Oxygen delivery systems • Mechanical ventilatory support including long term ventilation (invasive / non-invasive) • Chest imaging • Pleural drain management • Respiratory physiotherapy • Paediatric tracheostomy • ECMO support for respiratory failure For each of the above **L1 conditions** expected knowledge will include:	**Conditions** • Pneumonitis e.g., aspiration, radiation, drug-induced • Interstitial lung disease • Diseases of the diaphragm • Lung transplantation **Topics** • Respiratory function tests • Chest ultrasound For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs For each of the above **L2 topics,** expected knowledge will include: • Principles and practice • Interpretation • Controversies and risks

• Epidemiology • Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs For each of the above **L1 topics,** expected knowledge will include: • Relevant anatomy • Principles and practice • Interpretation • Relevant guidelines and evidence • Controversies and risks	For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs For each of the above **L2 topics,** expected knowledge will include: • Principles and practice • Interpretation • Controversies and risks

2.1.6 Gastrointestinal (GI) and Metabolic Intensive Care

L1	**L2**
Conditions • Congenital anomalies of the GI tract and abdominal organs • Acute gastrointestinal bleeding • Acute and fulminant hepatic failure • Chronic hepatic failure • Liver transplantation • Pancreatitis • Acute abdomen (including ischaemia, perforation, obstruction and infection) • Inborn errors of metabolism commonly causing ICU admission **Topics** • Enteral and parenteral nutrition • Energy Expenditure and Metabolism • Malnutrition and overfeeding • Refeeding syndrome • Abdominal compartment syndrome • Abdominal imaging techniques	**Conditions** • Oesophageal pathologies • Infections commonly requiring ICU support including, but not limited to pseudo-membranous colitis, typhlitis, peritonitis, cholecystitis, toxic megacolon • Gastro-intestinal motility syndromes • Gastro-oesophageal reflux • Gastro-intestinal malignancies • Transplant of other abdominal organs
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology • Aetiology and prevention • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient	For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs

needs For each of the above **L1 topics,** expected knowledge will include: • Relevant anatomy • Principles and practice • Interpretation • Relevant guidelines and evidence • Controversies and risks	

2.1.7 Renal Intensive Care

L1 **Condition** • Congenital malformations of the kidney and urinary tract • Renal injury • Renal failure • Hypertensive crisis • Urosepsis **Topics** • Renal replacement therapy • Acid-base and electrolyte disorders • Blood gas analysis	**L2** **Conditions** • Nephrotic and nephritic syndromes • Interstitial nephritis • Renal malignancy • Renal Transplantation **Topics** • Renal imaging
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology • Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient	For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs For each of the above **L2 topics,** expected knowledge will include: • Relevant anatomy

needs For each of the above **L1 topics,** expected knowledge will include: • Relevant anatomy • Principles and practice • Interpretation • Relevant guidelines and evidence • Controversies and risks	• Principles and practice • Interpretation • Controversies and risks

2.1.8 Neurological Intensive Care

L1 **Conditions** • Seizure disorders including status epilepticus • Acute cerebrovascular injury • Subarachnoid, subdural and intracranial haemorrhage • Delirium • Meningitis and encephalomyelitis • Hypoxic ischaemic encephalopathy • Intracranial hypertension • Brain death • ICU acquired weakness • Acute paralytic syndromes • Spinal cord disorders • Space occupying lesions • Venous sinus thrombosis **Topics** • Disorders of consciousness • Intracranial pressure monitoring • Cerebral protection strategies • Interpretation of cerebrospinal fluid • Brain CT and CT angiography	**L2** **Conditions** • Neurological malignancy[1] • Posterior reversible encephalopathy syndrome • Progressive and relapsing neuromuscular disorders including myasthenia gravis **Topics** • Neuromonitoring including but not limited to EEG, SSEP • Brain MRI
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology • Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing	For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae

[1] Neurological malignancies can be classified as a space occupying lesion; however, candidates are required to know histological, chemotherapy and prognostic information at a L2 level only.

resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs For each of the above **L1 topics,** expected knowledge will include: • Relevant anatomy • Principles and practice • Interpretation • Relevant guidelines and evidence • Controversies and risks	Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs For each of the above **L2 topics,** expected knowledge will include: • Indications and relevant guidelines • Controversies and risks

2.1.9 Endocrine Intensive Care

L1 **Conditions**	**L2** **Conditions**
• Diabetic ketoacidosis • Diabetes insipidus • Hyperglycaemia and hypoglycaemia • Acute thyroid crises • Pituitary crises • Adrenocortical insufficiency • SIADH • Cerebral salt-wasting syndrome	• Cushing's disease • Conn's syndrome • Other thyroid disorders • Phaeochromocytoma and paraganglioma
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology • Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with	For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae

supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs	Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs

2.1.10 Immunological and Rheumatological Intensive Care

L1	**L2**
Conditions • Anaphylaxis • Severe drug reactions, toxic epidermal necrolysis and Stevens-Johnson syndrome • Haemophagocytic lymphohistiocytosis and macrophage activation syndrome • Kawasaki disease • Multisystem inflammatory syndrome in children (MIS-C) **Topics** • Plasma exchange modalities	**Conditions** • Autoimmune and connective tissue diseases e.g., SLE, RA, scleroderma. • Other vasculitides • Congenital and acquired immunodeficiency **Topics** • Relevant effects of chemotherapeutic and immunomodulator therapies
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology • Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to:	For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment

• Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs	• Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs For each of the above **L2 topics,** expected knowledge will include: • Principles and practice • Clinical sequelae • Controversies and risks

2.1.11 Haematological and Oncological Intensive Care

L1	**L2**
Conditions • Anaemia • Neutropaenia • Lymphopaenia • Thrombocytopaenia • Haemoglobinopathies • Haematological malignancies • Tumour lysis syndrome • Haemolysis • Coagulation disorders (congenital and acquired) • Hyperviscosity syndromes (congenital and acquired) **Topics** • Bone marrow failure • Stem cell and bone marrow transplantation • Haemostatic failure and thrombophilia • Blood product transfusion • Point of care tests of coagulation	**Conditions** • DVT causes and management • Common solid tumours of childhood **Topics** • Oncology treatment including immunomodulation therapies • Blood films relevant to ICU practice
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology • Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with	For each of the above **L2 conditions** expected knowledge will include: • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae

supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs For each of the above **L1 topics,** expected knowledge will include: • Principles and practice • Interpretation • Relevant guidelines and evidence • Controversies and risks	Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop a management plan tailored to patient needs For each of the above **L2 topics,** expected knowledge will include: • Clinical sequelae • Interpretation

2.1.12 Trauma Intensive Care

L1 **Conditions** • Shock • Traumatic brain injury • Faciomaxillary and upper airway trauma • Chest trauma • Spinal trauma • Abdominal and pelvic trauma • Compartment syndromes • Rhabdomyolysis **Topics** • Non accidental injury • Severe and/or multiple trauma • Massive haemorrhage and massive transfusion • Haemostatic management	**L2** **Topics** • Blast injury • Limb injuries including traumatic amputations
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology	For each of the above **L2 topics** expected knowledge will include: • Principles and practice

• Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to: • Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs For each of the above **L1 topics** expected knowledge will include: • Relevant anatomy • Principles and practice • Relevant guidelines and evidence • Controversies and risks	• Controversies and risks

2.1.13 Environmental Injuries and Toxicology in ICU

L1 **Conditions** • Poisoning and drug intoxication • Burns • Electrocution • Envenomation • Submersion/Immersion • Thermal injury (heat and cold) • Malignant hyperthermia • Neuroleptic malignant syndrome • Serotonin syndrome
For each of the above **L1 conditions** expected knowledge will include:

- Epidemiology
- Aetiology
- Pathophysiology and clinical course
- Assessment encompassing history, clinical examination, and relevant investigations
- Management encompassing resuscitation, definitive treatment, (including specific antidotes) initial and ongoing monitoring with supportive treatment
- Complications and known sequelae
- Relevant guidelines and evidence

Candidates should be able to:

- Apply knowledge to intensive care clinical scenarios
- Perform an appropriate clinical assessment
- Analyse and synthesise information from a clinical assessment and investigations

Develop an evidence-based management plan tailored to patient needs

2.1.14 Organ and Tissue Donation in Intensive Care

L1
Topics

- Determination of death (neurological, circulatory)
- Care of the potential organ donor
- Organ and tissue donation after death
- Patient and family-centred care
- Best practice in organ donation

For the expected knowledge of the above **L1 Topics** candidates are referred to the *ANZICS Statement on Death and Organ Donation*

2.1.15 Populations requiring special considerations in Intensive Care

During ICU admission

- Aboriginal, Torres Strait Islander, Māori and Pasifika children
- Children from diverse cultural, linguistic and religious backgrounds
- The vulnerable child
- The child with chronic illness, disability or technology dependence
- The child with a genetic or syndromal disorder
- The child with a behavioural disorder
- The obese child
- The long-stay ICU patient

After ICU admission

- Sequelae of prolonged ICU admission

For each of the above **populations** expected knowledge will include:

- Family, social and cultural factors important to delivery of ICU care
- Anatomical, physiological and pathophysiological alterations impacting on ICU care
- Logistic considerations to provision of ICU care
- Assessment encompassing history, clinical examination, and relevant investigations

- Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment
- Complications and known sequelae
- Relevant guidelines and evidence
- Ethical considerations

Candidates should be able to:

- Apply knowledge to intensive care clinical scenarios
- Perform an appropriate clinical assessment
- Analyse and synthesise information from a clinical assessment and investigations
- Develop an evidence-based management plan tailored to patient and family needs

2.1.16 Neonatal Intensive Care

L1 **Conditions** • Persistent pulmonary hypertension • Meconium aspiration syndrome • Newborn hypoxic ischaemic encephalopathy • Intraventricular haemorrhage of the newborn • Necrotising enterocolitis • Neonatal jaundice • Neonatal sepsis • Acute congenital surgical conditions **Topics** • The transitional circulation • Sequelae of prematurity	**L2** • Neonatal respiratory distress syndrome • Transient tachypnoea of the newborn • Hyperinsulinaemia **Topics** • Care of the premature neonate • Care of the small for gestational age neonate • Neonatal resuscitation
For each of the above **L1 conditions** expected knowledge will include: • Epidemiology • Aetiology • Pathophysiology and clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment • Complications and known sequelae • Relevant guidelines and evidence Candidates should be able to:	For each of the above **L2 topics** expected knowledge will include: • Principles and practice • Controversies and risks

• Apply knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from a clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs For each of the above **L1 topics,** expected knowledge will include: • Relevant anatomy • Principles and practice • Relevant guidelines and evidence • Controversies and risks	

2.1.17 Peri-operative Issues in Intensive Care

L1	**L2**
Peri-operative **topics**: • Cardiac surgery: including congenital and acquired heart disease • Thoracic surgery: including airway surgery, lobectomy, repair of congenital diaphragmatic hernia • Neurosurgery: including craniotomy and craniectomy for common indications • Major spinal surgery • Abdominal surgery: including surgery for congenital and acquired disorders • High risk patients undergoing elective surgery	Peri-operative **topics**: • Interventional radiology procedures • Trauma surgery
For each of the above **L1 topics** expected knowledge will include: • Risk assessment • Anatomy and surgical technique relevant to ICU post-operative care • Expected post-operative clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, initial and ongoing monitoring and supportive treatment • Complications and known sequelae • Relevant guidelines and evidence	For each of the above **L2 topics** expected knowledge will include: • Expected post-operative clinical course • Assessment encompassing history, clinical examination, and relevant investigations • Management encompassing resuscitation, initial and ongoing monitoring and supportive treatment • Complications and known sequelae Candidates should be able to: • Apply this knowledge to intensive care clinical scenarios

Candidates should be able to: • Apply this knowledge to intensive care clinical scenarios • Perform an appropriate clinical assessment • Analyse and synthesise information from clinical assessment and investigations • Develop an evidence-based management plan tailored to patient needs	• Perform an appropriate clinical assessment • Analyse and synthesise information from clinical assessment and investigations

2.1.18 Intensive Care Procedures

L1

Cardiac

- Arterial line
- Central venous catheter
- Vascular access ultrasound
- Umbilical vessel cannulation
- Temporary cardiac pacing
- ICU echocardiography (not congenital heart disease diagnostic echocardiography)
- Pericardiocentesis
- Defibrillation and cardioversion
- Cardiac advanced life support

Respiratory

- Intubation
- Prone positioning
- Bronchoscopy
- Front of neck airway access
- Chest ultrasound
- Pleural drainage

Gastrointestinal

- Enteral feeding tubes (NG, NJ, PEG and PEJ)
- Ascitic drain
- Balloon tamponade tube (i.e., SB or Minnesota)

Renal

- Dialysis catheter insertion
- Vascath
- Urinary catheter insertion

Neuro

- Lumbar puncture
- Brain death testing

Other

- Spinal Immobilisation

- Intra-osseous access
- Pelvic binders
- Temperature management
- Decontamination for toxicology
- Personal protective equipment

For each of the above expected knowledge will include:

- Indications
- Relevant anatomy
- Procedural details including insertion, removal, and management
- Interpretation
- Advantages and disadvantages
- Complications

2.1.19 Radiology in Intensive Care

Radiological Investigations

- Chest X-Ray, C-spine X-Ray, abdomen and pelvis X-Ray
- CT head/neck/thorax/abdomen and pelvis
- Contrast studies CT head/neck/abdomen/cardiac/thorax/pelvis (arterial and venous phase)
- MRI brain and spine
- Infant cranial ultrasound
- Cerebral angiography for the purposes of brain death determination
- Nuclear medicine for the purposes of brain death determination.

For each of the above **investigations** expected knowledge will include:

- Indications
- Relevant anatomy
- Procedural details relating to ICU management
- Interpretation (basic interpretation of MRI brain only)
- Advantages and disadvantages
- Complications and risks
- Relevant guidelines and evidence

2.1.20 Applied Pharmacology in Intensive Care

Cardiovascular

- Inotropes and vasopressors
- Systemic vasodilators and pulmonary vasodilators
- Antiarrhythmics
- Antihypertensives

Respiratory

- Bronchodilators
- Corticosteroids

Renal

- Diuretics

- Renal replacement fluid
- Intravenous Fluids
- Electrolyte replacements

Neuro

- Sedatives
- Volatile anaesthetics
- Analgesics
- Antipsychotics
- Anticonvulsants
- Local Anaesthetics
- Neuromuscular Blockers

Gastrointestinal

- Prokinetics
- H2 blockers
- Proton pump inhibitors
- Antiemetics
- Aperients and laxatives
- Nutrition – enteral and parenteral
- Other – octreotide

Haematological

- Anti-platelet agents
- Anticoagulants
- Fibrinolytics
- Antifibrinolytics
- Blood products and derivatives

Immunology

- Antimicrobials
- Immunomodulators

Endocrine

- Hypoglycaemics – subcutaneous and intravenous
- Steroids
- Vasopressin and its analogues

Antidotes and Reversal Agents

For commonly used drugs in each of the above classes expected knowledge will include:

- Indications and contraindications
- Safe clinical use in intensive care, including reversal of effect where appropriate.
- Common or severe adverse effects including withdrawal syndromes

Candidates should be able to discuss the use of these drugs in intensive care including the available evidence.

Detailed mechanism of action, pharmacokinetic and pharmacodynamic information is not required. This is covered in the Part I syllabus and examination.

2.2 Communicator and Collaborator

2.2.1 Communication and collaboration in Intensive Care

Topics

- Communication with patients and families as part of care in the ICU
- Consent in paediatric intensive care
- Handover and referrals
- Family/whānau meetings
- Shared decision making
- Open disclosure
- Providing information for discharge
- Intra and Inter-professional communication and collaboration in situations that include but are not limited to critical clinical events, resuscitation, retrievals and debriefing
- Challenging conversations, including, but not limited to breaking bad news, end of life care, organ donation and conflict resolution

For the above topics candidates should be able to discuss and demonstrate effective, respectful and empathetic, professional, culturally safe and patient/family/ whānau centred communication skills.

2.3 Leader and Manager

2.3.1 Intensive Care Administration

Topics

Safety and Quality

- Clinical audit
- Quality improvement
- Change management
- Occupational health and safety standards relevant to intensive care
- Incident reporting and review

Resource Allocation and Management

- Equipment assessment and provision
- Personnel management and staffing
- Promoting and maintaining a safe workplace culture
- Sustainable health care practice

For the above topics Candidates should be able to discuss the purpose and processes of these activities in relation to Intensive Care.

2.4 Health Advocate

2.4.1 Aboriginal, Torres Strait Islander, Māori and Pasifika Health and cultural safety

Topics

- Aboriginal and Torres Strait Islander Health
- Hauora Māori
- Cultural safety in healthcare for Aboriginal and Torres Strait Islander, Māori, and Pasifika populations

For the above topics candidates should be able to:

- Demonstrate how they would model and promote culturally safe healthcare in the Intensive care environment

Scholar and Educator

2.5.1 Research and Evidence Based Practice in Intensive Care

Topics

Candidates should be able to discuss the following:

- The different levels of evidence
- Research methods for randomised trials including population, intervention, control, outcome, randomisation and allocation concealment
- Research methods for observational studies including population, sample, exposure, types and use of a control group (e.g. case control and cohort studies), ability to control for confounders, analysis and outcomes
- Research methods for systematic reviews including literature search, general methods around inclusion/data extraction, risk of bias assessment, a general understanding of pooling of the data (e.g. forest plots) and heterogeneity
- Critical appraisal of major study types
- Aspects of statistics including data types and approaches to data analysis, (including, but not limited to normal and non-normal distribution of continuous data, risk ratio and diagnostic studies specificity and sensitivity, positive and negative predictive value and receiver operating curves)
- Ethical issues in performing research in the critically ill child, including issues related to age of participant, consent, emergency treatment, and assessment of risk
- The role and use of qualitative research in PICU
- The role and use of Platform trials and Bayesian analysis in PICU

2.5.2 Educator

Topics

Candidates should be able to discuss the following:

- Components and structure of an ICU education programme for trainees in intensive care
- Providing feedback to trainees in intensive care

- The role of the medical educator in intensive care
- The opportunities for teaching and learning in clinical intensive care practice.

2.6 Professional

2.6.1 Ethical and legal considerations in Intensive Care

Candidates should be able to discuss the following:

- Concepts of patient autonomy, beneficence, non-maleficence, and justice (as it applies to fair distribution of resources)
- The importance of family when facing ethical or legal considerations concerning a child
- Principles of informed consent in children at different stages of development
- Issues and principles involved in withholding and withdrawing treatment, and the care of the dying patient
- Ethics of resource allocation in the face of competing claims to care
- Legal issues and principles involved in the diagnosis of brain death and the process of organ donation

2.6.2 Professional behaviour

Candidates should be able to:

- Demonstrate an understanding of the responsibilities of belonging to a profession
- Behave with compassion, integrity and honesty towards colleagues, patients, their families and the public
- Demonstrate professional behaviour during the conduct of the clinical examination

3 APPENDIX

A note on calculations used in the Second Part Paediatric examination:

Anion Gap & Delta Ratio
Normal anion gap is 12
Potassium is not used in the calculation
All anion gaps should be corrected for albumin if the stated albumin level is <40
The anion gap is not corrected for phosphate.

Delta Ratio = (change in anion gap) / (change in bicarbonate)
Assuming the normal AG =12 and the normal HCO_3 is 24

Delta ratio of < 0.4 = normal anion gap acidosis
Delta ratio of 0.4-0.8 = mixed high and normal anion gap acidosis
Delta ratio of 0.8- 1.0 = high anion gap
Delta ratio of 1-2.0 = high anion gap exists
Delta ratio over >2.0 = a high anion gap acidosis and a metabolic alkalosis is present

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