



**The National Alliance of  
Respiratory Therapy Regulatory Bodies**

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**L'Alliance nationale des organismes de  
réglementation de la thérapie respiratoire**

**National Competency Framework  
for the Profession of Respiratory Therapy**

**Part II**

**National Guidelines**

**Competencies Throughout Career Stages**

**August 2016**

## Introduction

Part II of the National Competency Framework (NCF) contains the expectations at key stages of the RT's career, (not just at registration or entry to practice);

- the competencies are each expressed with the knowledge they require;
- the degree of mastery expected at each career stage is shown precisely; and
- it is competency-based rather than task-based, and patient-centred.

Please refer to Part I of the National Competency Framework for the national standards required for entry-to-practice.

Part II of the NCF serves as the pan-Canadian guidelines for the competencies relevant to respiratory therapy practice throughout the following career stages and supports career planning, development and progression.

### Experienced

The Experienced Professional career stage requires a fluency of operation beyond entry to practice. Experienced Professionals can do everything the new entrant can, but with more mastery and a higher level of confidence. The timeframe of an RT progressing from entry to practice to Experienced Professional depends on experience, including hours worked, the complexity and variety of clinical situations, opportunities for on-the-job coaching and applied research opportunities. Typically, an RT who is exposed to the full scope of practice can be expected to progress from entry to practice to Experienced Professional with approximately 4,000 hours of practice.

### Senior Professional

Some RTs take on the additional responsibilities of a Senior Professional in their organization. This requires enhanced core competencies to lead a team of colleagues, implying a strong understanding of the organization's environment and the RT role, including the development and implementation of RT policies and strategies. It would normally include formal responsibility for a team and their actions. It does not necessarily require any enhanced clinical competencies above other Experienced Professionals. This career stage stretches from first level team leaders and supervisors up to senior managers with significant administrative duties. However the degree of mastery shown in the NCF is that expected for entry to the Senior Professional career stage. Senior Professionals often also develop an Expert role.

### Expert

Some RTs become Experts by developing an expertise in one area of the profession such as paediatrics. Experts are invited to speak at events because of expertise in their area. They often work with their regulatory bodies and promote the improvement of practice standards. They participate in research and sometimes publish textbooks. To develop new strategies, policies or techniques for the profession requires expert clinical knowledge and experience, but most likely in a narrow range of expertise. It requires both strong technical expertise and promoting the adoption of improved practices by the RT profession. Experts may also take on a Senior Professional role.

## How to Read the Detailed Performance and Knowledge Criteria

This NCF presents a detailed description of the competencies required for RTs entering practice and at other key points of their career. In addition, we have identified the Attitudes and Values that underpin the profession. To some extent, the practice (and therefore the competency) will depend on the circumstances surrounding the patient being cared for. Each competency is described using the following items:

This NCF presents a detailed description of the competencies required for RTs entering practice and at other principal points of their career. In addition, we have identified the Attitudes and Values that underpin the profession. To some extent, the practice (and therefore the competency) will depend on the patient being cared for. Each competency is described using the following items:

### Competency Statement

Each competency is defined using a short action statement describing what an RT must be able to do to be considered competent at an entry-to-practice level. The verb used gives an idea of the required level of performance. We have distinguished between three competency domains: Foundation Science, Core Competencies and Clinical Competencies.

### Performance Criteria

The performance criteria section for each competency contains statements providing additional details on the required level of performance (to be deemed a competent person) and what is to be assessed. Competence requires all performance criteria to be met.

### Range (clarification)

The range statements provide an explanation of words used in the performance criteria, or a clarification of the context for one or more performance criteria. Due to jurisdictional differences in scope of practice, for some competencies (for example, C5, C10) the range identifies the competencies RTs in one jurisdiction may perform, while RTs in other jurisdictions may assist other members of the health care team with the competency.

### Knowledge

In many cases, especially for a science-based profession like RT, it is essential to have a grounding in facts and theories. There is a separate section for each competency that identifies any specific knowledge required for that particular competency. In addition, the Foundation Science competencies underpin all of the other competencies (particularly the Clinical Competencies). Because the Foundation Science competencies are knowledge-based, they consist primarily of the Knowledge section.

### Degree of Mastery (Bloom's Trajectory) of Knowledge, Skills and Attitudes (KSA)

The same competencies are used by an RT at different career stages. However, the degree of mastery of the competencies is very different for someone at entry to practice compared to someone who is an experienced professional, or who has become an expert in a particular area. We have used Bloom's Trajectory as our measure of degree of mastery for each competency at each career stage – see [Appendix 1](#). This identifies the degree of mastery for each of the three domains of knowledge, skills and attitudes. This classification makes it clear to the trainee or practicing RT exactly what proficiency is expected, and is of particular relevance for RT educators (identifying what learning experiences will be required) and assessors (indicating what types of assessment will be appropriate). Due to jurisdictional

differences in availability of clinical training and/or scope of practice, some competencies have been defined at skill level 2 for neonatal and paediatric patient groups. This level 2 accepts the “below-competent” level of the new graduate and recommends that further on-the-job training or certification is required before the RT can be considered fully competent for these specific competencies.

### **Progression Path**

The new RT Framework contains four career stages: the national standard for Entry to Practice is outlined in Part I; national guidelines for the Experienced Professional, the Senior Professional and the Expert are outlined in Part II. The same competencies are required throughout the career; however, the degree of mastery of each competency will improve. The typical progression path from entry-to-practice to senior professional or expert is shown in the Progression Path section, which describes the increasing degree of mastery along Bloom’s Trajectory for the three domains of knowledge, skill and attitude.

The new RT Framework contains four career stages: the national standard for Entry to Practice is outlined in Part I; national guidelines for the Experienced Professional, the Senior Professional and the Expert are outlined in Part II. The same competencies are required throughout the career; however, the degree of mastery of each competency will improve. The typical progression path from entry-to-practice to senior professional or expert is shown in the Progression Path section, which describes the increasing degree of mastery along Bloom’s Trajectory for the three domains of knowledge, skill and attitude.

The performance criteria are those for entry to practice. In a few cases, additional performance criteria are expected for the Experienced Professional or Expert, in which case these are also shown.

The career stage Senior Professional does not require an increase in clinical competencies and so does not follow the progression path for the clinical competencies (C) and foundation science (S). Senior Professionals require higher degrees of mastery in several of the Core Competencies (notably B1 Professional, B2 Communication, B6 Administration) and the additional Core Competency (B8 Accountability), which are not required for those practising their profession as RTs.

The career stage Expert is unlike all the other career stages. It does not require the expert degree of mastery for all the competencies. It is sufficient to be an expert in a single competency (although it is more common to be an expert in several competencies). However, a competent expert does require enhanced core competencies for B2 Communication and B5 Critical Thinking & Reasoning. These are therefore shown as Essential, while others are shown as Optional.

|   |  |
|---|--|
| <p style="text-align: center;"><b>Attitudes and Values</b></p>  | <p>A1 Duty to patients<br/> A2 Duty to others<br/> A3 Perform within competence<br/> A4 Confidentiality<br/> A5 Participate in continuous professional development<br/> A6 Independence and impartiality<br/> A7 Honesty and integrity<br/> A8 Supervision of others<br/> A9 Comply with codes of conduct and practice<br/> A10 Professional liability insurance<br/> A11 Conflicts with moral or religious beliefs<br/> A12 Environment and sustainability<br/> A13 Obligation to report unsafe or inappropriate practices<br/> A14 Behaviour</p> |
| <p style="text-align: center;"><b>Core Competencies</b></p>     | <p>B0 Provide evidence-informed, patient-centred, respiratory care<br/> B1 Demonstrate professional behaviour<br/> B2 Communicate effectively<br/> B3 Collaborate in the interdisciplinary health care team<br/> B4 Optimize cardio-respiratory health and wellness of the community<br/> B5 Demonstrate critical thinking and reasoning skills<br/> B6 Perform administrative duties<br/> B7 Implement preventive measures to ensure health and safety<br/> B8 Demonstrate accountability appropriate to role in the health care team</p>         |
| <p style="text-align: center;"><b>Clinical Competencies</b></p> | <p>C1 Assess patient's cardio respiratory status<br/> C2 Optimize patient safety<br/> C3 Administer medication and substances<br/> C4 Manage airway<br/> C5 Perform anaesthesia assistance<br/> C6 Provide optimal ventilation assistance<br/> C7 Execute resuscitation<br/> C8 Administer cardio-pulmonary diagnostic tests<br/> C9 Perform adjunct therapies<br/> C10 Perform invasive vascular procedures</p>   |
| <p style="text-align: center;"><b>Foundation Science</b></p>    | <p>S1 Apply knowledge of anatomy and physiology<br/> S2 Apply knowledge of chemistry and biochemistry<br/> S3 Apply knowledge of physics<br/> S4 Apply knowledge of pharmacological principles<br/> S5 Apply knowledge of microbiology<br/> S6 Apply knowledge of pulmonary pathophysiology<br/> S7 Apply knowledge of cardiovascular pathophysiology<br/> S8 Apply knowledge of other diseases and disorders</p>  |

*The degree of mastery is specified for each career level for all the Clinical Competencies and a few of the Core Competencies, where appropriate.*

## **Attitudes and Values of Respiratory Therapists**

**These attitudes and values are also incorporated within the detailed competency statements.**

### **A1. Duty to patients**

RTs owe a duty of care to patients and their families. They shall perform their duties in a safe and competent manner, being guided at all times by their concern for the health and well-being of the patient. They must display a positive, helpful, and sensitive attitude to patients, recognizing that they may not have a good understanding of their illness or its treatment. RTs must always be aware that the result of their treatments will directly affect the outcome of patients. They need to communicate with clarity and sensitivity. They must respect and protect the legal rights of the patient, including the right to informed consent and refusal or withdrawal of treatment.

### **A2. Duty to others**

At the same time, RTs have a duty to their health care colleagues, employers, regulatory authorities, and the wider public. They must show proper care regarding expenditure of public money and must not compromise public health and safety.

### **A3. Perform within competence**

RTs shall perform their duties within their own level of competence and respect the level authority assigned to them. Should the delivery of care extend beyond their level of competence, RTs must seek additional knowledge or assistance from another member of the health care team.

### **A4. Confidentiality**

In accordance with relevant legislation, RTs must respect the confidentiality of individual patients' personal information and ensure information about an individual is not disclosed improperly or without the informed consent of the individual.

### **A5. Participate in continuous professional development**

RTs have a responsibility to maintain competency in their field of practice and must participate in continuous professional development throughout their working lives. Practitioners will keep their knowledge in their field of practice up to date and will extend their competencies as the demand for new services develops.

### **A6. Independence and impartiality**

RTs must carry out their professional tasks with respect for the rights and dignity of all individuals and without any form of discrimination because of age, ancestry, colour, citizenship, disability, family status, gender, marital status, place of origin, political beliefs, religion, sexual orientation, or source of income. They have the right to exercise personal judgment in the context of their responsibilities after taking into account all relevant circumstances, without any application of external influence. Advice and treatment should be given impartially and objectively, without pressure from external sources and without conflicts of interest.

### **A7. Honesty and integrity**

RTs are required to act with honesty and integrity in their relationships with patients and others, including professional colleagues. They must not engage in any activity or behaviour that creates or

appears to create a conflict of interest or would be likely to bring their organization or the profession into disrepute or undermine public confidence in the profession.

#### **A8. Supervision of others**

RTs who supervise others are required to ensure that any member of their team to whom a task is delegated has the competency (attitudes, knowledge, and skills) necessary to undertake that task effectively and efficiently. They should always provide appropriate supervision and support. The responsibility for a delegated task remains with the delegator.

#### **A9. Comply with codes of conduct and practice**

RTs must comply with the provisions of relevant legislation and the provisions of codes of practice and standards relating to the professional services they provide.

#### **A10. Professional liability insurance**

RTs have a professional responsibility to carry professional liability insurance at a level sufficient to ensure the patient will be adequately compensated in the event of a justified claim arising from professional practice. RTs also should have some personal liability insurance to cover their legal and other expenses related to these claims or any claims alleging professional misconduct. While some organizations provide their employees with some level of liability insurance, it is the responsibility of the RTs to ensure that the level of coverage is adequate for the protection of the public and of their professional rights.

#### **A11. Conflicts with moral or religious beliefs**

In the event of conflicts with moral or religious beliefs arising from a request for the provision of RT services, members of the profession have an obligation to provide information on where that service can most conveniently be obtained from a professional colleague. After agreeing to provide a service, RTs are bound to set aside any personal, religious, political, philosophical, or other convictions.

#### **A12. Environment and sustainability**

RTs should be aware of environmental issues; their actions should not lead to needless waste of energy, time, or other resources.

#### **A13. Obligation to report unsafe or inappropriate practices**

RTs have a responsibility to report unsafe or inappropriate practices to the relevant authorities. They should use the official procedures in the first instance, but should escalate or use other channels if the circumstances require. This obligation overrides any contractual or employment limitations. Those in authority have a duty to investigate such allegations fairly and without discrimination or recrimination.

#### **A14. Behaviour**

RTs shall be accountable for their practice, and will act professionally at all times. They shall strive to be a role model for other members of the health care team by demonstrating responsibility, cooperation, accountability and competence in meeting the health care needs of the public. RTs shall advocate their role as leaders in the promotion of health and the delivery of quality respiratory care.

## **CORE COMPETENCIES**

## CORE COMPETENCY

### **B0 Provide evidence-informed, patient-centred, respiratory care**

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**B0.1 Demonstrate empathy and respect towards the patient and family**

**B0.2 Establish partnerships with patients and families**

**B0.3 Plan respiratory care**

**B0.4 Apply evidence to practice**

*These elements of Competency apply to all the Clinical Competencies.*

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#### **B0.1 Demonstrate empathy and respect towards the patient and family**

##### **Performance criteria**

B0.1.1 Respect the rights, privacy and dignity of all individuals

B0.1.2 Consider and minimise the effects of psychosocial stress factors on the patient and family

B0.1.3 Establish a caring, supportive attitude and behaviour towards the patient and family

B0.1.4 Avoid any form of discrimination against patients and family, colleagues or others

##### **Range (clarification)**

- a. psychosocial stress factors include: beliefs, concerns, expectations and illness experience
- b. forms of discrimination may include, but are not limited to: age, ancestry, colour, citizenship, disability, family status, gender, marital status, place of origin, political beliefs, religion, sexual orientation, or source of income

##### **Knowledge**

- attributes associated with a supportive and caring professional attitude and behaviour
- the causes and effects of patient psychosocial stress factors and their impacts
- the psychosocial implications of particular situations, such as palliative care and disease stigmas
- human rights (as a basis for understanding patient rights, discrimination, etc.)
- provincial or national legislation pertaining to patient rights (for example: Charter of Rights and Freedoms, Provincial Human Rights Codes, privacy legislation)

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K5, S5, A3               | K5, S5, A4          | K5, S5, A4        |

## B0.2 Establish partnerships with patients and families

### Performance criteria

B0.2.1 Establish and maintain relationships

B0.2.2 Actively collaborate with patients and families in decision-making and care planning

B0.2.3 Support patients and families throughout the patient experience

### Range (clarification)

- a. relevant information originates from assessment, chart review, other care providers, patient and family

### Knowledge

- relevant legal aspects of the relationship between the health care worker and the patient/family
- appropriate techniques and conditions for establishing and maintaining relationships (for example, empathy, emotional intelligence, etc.)
- communication principles

| Career Stage   | Experienced Professional  | Senior Professional | Expert (Optional) |
|--|---|---------------------|-------------------|
| Degree of Mastery  | K4, S4, A3  | K5, S5, A4          | K5, S5, A4        |
| <b>Additional performance criteria for Experienced Professionals</b> | B0.2.4 Participate in improving respiratory care policies and protocols |                     |                   |

## B0.3 Plan respiratory care

### Performance criteria

B0.3.1 Synthesize relevant information

B0.3.2 Considering patient goals and expectations, identify opportunities to improve patient outcomes

B0.3.3 Develop respiratory care plans, taking into account patient goals and expectations

B0.3.4 Implement respiratory care plans

B0.3.5 Monitor and evaluate patient outcomes resulting from implementation of respiratory care plans

### Range (clarification)

- a. respiratory care plan includes intervention, procedures, medication
- b. patient goals and expectations: includes end of life

| Career Stage   | Experienced Professional                       | Senior Professional | Expert (Optional) |
|--|--|---------------------|-------------------|
| Degree of Mastery  | K5, S5, A4                                     | K5, S5, A4          | K6, S6, A4        |
| <b>Additional performance criteria for Experienced Professionals</b> | B0.3.6 Develop respiratory treatment protocols |                     |                   |

## **B0.4 Apply evidence to practice**

### **Performance criteria**

B0.4.1 Use the best available evidence in making decisions about patient care

B0.4.2 Identify the patient's unique health state, their individual risks and benefits from potential interventions

B0.4.3 Identify the patient's preferences and values

### **Knowledge**

- different research designs and the strengths and limitations of each
- sources of current information on relevant research

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K4, S4, A2               | K5, S5, A3          | K6, S6, A4        |

## CORE COMPETENCY

### **B1 Demonstrate professional behaviour**

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- B1.1 Exhibit professional behaviour**
- B1.2 Adhere to the scope of practice**
- B1.3 Adhere to professional clinical, legal, and ethical guidelines/regulations**
- B1.4 Adhere to institutional/organizational policies and procedures**
- B1.5 Participate in professional development**
- B1.6 Participate in quality improvement processes**

*These elements of Competency apply to all the Clinical Competencies.*

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#### **B1.1 Exhibit professional behaviour**

##### **Performance criteria**

- B1.1.1 Use professional language
- B1.1.2 Behave in a professional manner in accordance with the standards of the profession
- B1.1.3 Wear professional attire in accordance with clinical requirements in all situations
- B1.1.4 Provide advice and treatment impartially and objectively, without pressure from external sources and being aware of conflicts of interest
- B1.1.5 Act with honesty and integrity, avoiding behaviour likely to bring the organization or profession into disrepute or undermine public confidence in the profession

##### **Range (clarification)**

- a. professional behaviour with patients, their families, members of the health care team, the general public

##### **Knowledge**

- conflicts of interest, conflict resolution

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K4, S5, A3               | K5, S5, A4          | K6, S6, A4        |

#### **B1.2 Adhere to the scope of practice**

##### **Performance criteria**

- B1.2.1 Identify actions that would be outside the scope of practice
- B1.2.2 Advise the appropriate people of any potential needs outside the scope of practice

B1.2.3 Identify and refer to appropriate persons who can provide the out-of-scope requirements

**Range (clarification)**

- a. the appropriate people/persons: the patient, the patient’s representative, health care professionals, inter-professional team, colleagues, employer
- b. scope of practice: employment, personal, legislative

**Knowledge**

- the relevant domains of practice (nationally) and sources of relevant provincial information
- the standards of practice per applicable regulatory body
- professional responsibilities and accountabilities as it pertains to the profession
- relevant professional responsibilities and capabilities of related professions

| Career Stage      | Experienced Professional | Senior Professional | Expert     |
|-------------------|--------------------------|---------------------|------------|
| Degree of Mastery | K4, S5, A4               | K5, S5, A4          | K6, S5, A4 |

**B1.3 Adhere to professional clinical, legal and ethical guidelines/regulations**

**Performance criteria**

- B1.3.1 Understand relevant guidelines/regulations
- B1.3.2 Apply the guidelines/regulations
- B1.3.3 Take action to prevent relevant guidelines/regulations being ignored

**Knowledge**

- professional guidelines/regulations: clinical, legal and ethical
- relevant legislation

| Career Stage      | Experienced Professional | Senior Professional | Expert     |
|-------------------|--------------------------|---------------------|------------|
| Degree of Mastery | K4, S4, A4               | K5, S5, A4          | K5, S5, A4 |

**B1.4 Adhere to institutional/organizational policies and procedures**

**Performance criteria**

- B1.4.1 Remain current with relevant institutional/organizational policies and procedures
- B1.4.2 Adhere to all applicable policies and procedures
- B1.4.3 Help ensure that the applicable policies and procedures are adhered to by all
- B1.4.4 Report unsafe or inappropriate practices to the relevant authorities
- B1.4.5 Be aware of relevant environmental issues and avoid needless waste of resources

**Range (clarification)**

- a. institutional/organizational: employer, department, agency
- b. resources: personnel, energy, time, finance, equipment, material and other physical resources

**Knowledge**

- departmental, institutional/organizational and regulatory policies and procedures

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S5, A4               | K5, S5, A4          | K5, S6, A4 |

**B1.5 Participate in professional development****Performance criteria**

B1.5.1 Set personal goals and formulate a plan for personal professional development

B1.5.2 Identify opportunities for professional development

B1.5.3 Participate in appropriate professional development/continuing education activities

**Range (clarification)**

- opportunities: informal (both outside work and at work), formal programs (education and training), assessment, gaining a qualification

**Knowledge**

- the role and importance of professional development
- opportunities for continuing training and development

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K5, S5, A4 |

**B1.6 Participate in quality improvement processes****Performance criteria**

B1.6.1 Participate constructively in the organization's quality improvement process

B1.6.2 Develop awareness of strengths and scope for improvement

B1.6.3 Learn from feedback offered through the process

B1.6.4 Modify practice in response to the process

**Range (clarification)**

- quality improvement process: reflective practice, surveys, organizational procedures, informal feedback

**Knowledge**

- the organization's performance evaluation process
- the elements essential for an effective job performance appraisal

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K6, S6, A4 |

## CORE COMPETENCY

### **B2** *Communicate effectively*

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- B2.1 Demonstrate effective verbal and non-verbal communication skills**
  - B2.2 Communicate effectively through documentation**
  - B2.3 Use information communication technologies**
  - B2.4 Manage conflict and difficult behaviour**

*These elements of Competency apply to all the Clinical Competencies.*

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#### **B2.1 Demonstrate effective verbal and non-verbal communication skills**

##### **Performance criteria**

- B2.1.1 Show respect and empathy and communicate in a manner that is respectful of individual diversity
- B2.1.2 Use effective methods, including appropriate interview techniques, to obtain the patient's complete medical history and assess their level of health literacy
- B2.1.3 Employ active listening techniques to understand the needs of others
- B2.1.4 Convey information on investigations and treatments with the level of clarity appropriate to each patient's health literacy to allow for mutual understanding and informed consent
- B2.1.5 Use a variety of communication tools and techniques to enhance and assess understanding on the part of patients and their families
- B2.1.6 Use appropriate communication techniques to provide accurate and timely transfer of information at all transition points
- B2.1.7 Demonstrate insight into one's own communication style with patients and team members in various situations, and adjust this style appropriately to provide safe care

##### **Range (clarification)**

- a. communicate with patients, their families, members of the health care team, the general public
- b. interview techniques: for example, structured interview questionnaire, open-ended questions, paraphrasing, summarizing, focusing, using silence, non-verbal encouragement
- c. transition points: care transitions where clients experience a change in team membership or location
- d. communication styles: for example, direct and indirect
- e. various situations: ordinary, crisis, stressful

##### **Knowledge**

- terms and abbreviations used in RT
- moral and legal requirements related to patient diversity
- structured interview techniques (including patient-centred and clinician-centred steps)

- communication styles and methods to adapt
- communication techniques, channels and devices

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K5, S5, A4 |

## **B2.2 Communicate effectively through documentation**

### **Performance criteria**

- B2.2.1 Provide appropriately detailed, legible and clear entries to the patient health record, following every intervention with the patient
- B2.2.2 Clearly, legibly and accurately document patient care orders and prescriptions
- B2.2.3 Use appropriate and safe communication techniques in requests, reports and in correspondence outside the health record
- B2.2.4 Document and provide rationale for deviations from established processes or guidelines

### **Range (clarification)**

- communicate with patients, their families, members of the health care team, the general public
- documentation: written, recorded or drawn and stored on paper, digitally or a recording device
- appropriate and safe communication techniques: includes timely delivery and techniques ensuring patient privacy and confidentiality

### **Knowledge**

- documentation standards
- jurisdictional requirements for documentation
- types of documentation and messages

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K6, S5, A4 |

## **B2.3 Use information communication technologies**

### **Performance criteria**

- B2.3.1 Use information communication technologies appropriately and effectively to provide safe care to patients

### **Knowledge**

- the benefits, limitations and professional care responsibilities—including the confidentiality risks—of using information communication technologies (for example, electronic medical records, computerized professional order entries, telephone, fax, email) including, but not limited to, organizational policies related to use of personal devices, communication services, security protocols and social media

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K5, S5, A3               | K5, S5, A4          | K6, S5, A4 |

## **B2.4 Manage conflict and difficult behaviour**

### **Performance criteria**

B2.4.1 Understand conflict and difficult behaviour exhibited

B2.4.2 Identify who needs to be involved in resolving the conflict

B2.4.3 Address underlying issues

B2.4.4 Resolve conflict

### **Range (clarification)**

- a. conflict and difficult behaviour: with patients, families, the health care team, the general public

### **Knowledge**

- conflict management principles and techniques, adult learning principles, providing effective feedback, critical conversations theory
- employer practice and policy, Standards of Practice, Code of Ethics and other relevant guidelines

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K5, S6, A4 |

## CORE COMPETENCY

### **B3 Collaborate in the interdisciplinary health care team**

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**B3.1 Collaborate in professional consultation in an inter-professional health care team**

**B3.2 Apply therapeutic and diagnostic procedures based on research data, methods and results**

*These elements of Competency apply to all the Clinical Competencies.*

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#### **B3.1 Collaborate in professional consultation in an inter-professional health care team**

##### **Performance criteria**

B3.1.1 Negotiate overlapping of responsibilities to support a collaborative approach to patient care

##### **Range (clarification)**

- a. collaborate with: patient, patient's representatives and families, physicians, other colleagues in the health care professions, community partners, and health system stakeholders

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
|--------------------------|--------------------------|---------------------|------------|
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K6, S5, A4 |

#### **B3.2 Apply therapeutic and diagnostic procedures based on research data, methods and results**

##### **Performance criteria**

B3.2.1 Discuss pertinent data

B3.2.2 Review published research and select relevant data

##### **Knowledge**

- research methods

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
|--------------------------|--------------------------|---------------------|------------|
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S5, A4          | K6, S5, A4 |

## CORE COMPETENCY

### **B4 Optimize cardio-respiratory health and wellness of the community**

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#### **B4.1 Provide cardio-respiratory health education**

#### **B4.2 Participate in addressing cardio-respiratory health needs of the community**

*These elements of Competency apply to all the Clinical Competencies.*

---

#### **B4.1 Provide cardio-respiratory health education**

##### **Performance criteria**

B4.1.1 Provide education to support development of self-management skills

B4.1.2 Engage in activities that would enable people to increase control over their cardio-respiratory health

##### **Range (clarification)**

- a. provide education to, and engage in, activities with patients/clients, family members, community, advocates, caregivers, colleagues and health care professionals

##### **Knowledge**

- educational methods for enhancing comprehension, retention and assessment of self-management skills
- determinants of cardio-respiratory health
- methods for promoting a healthy cardio-respiratory lifestyle
- benefits of cardio-respiratory health
- smoking/vapour cessation methods

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
|--------------------------|--------------------------|---------------------|------------|
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K6, S6, A4 |

**For the Expert career stage, possible supplemental certifications include:** Certified asthma educator, Certified COPD educator, Certified respiratory educator and Certified tobacco educator.

#### **B4.2 Participate in addressing cardio-respiratory health needs of the community**

##### **Performance criteria**

B4.2.1 Provide RT services in a community setting

B4.2.2 Provide outreach services to the community

##### **Range (clarification)**

- a. community setting: primary care clinics, self-management clinics
- b. outreach services: telemedicine, pulmonary rehabilitation

## Knowledge

- purpose, strategies, and goals of community health programs

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K4, S4, A3               | K5, S5, A4          | K6, S6, A4        |

**For the Expert career stage, possible supplemental certifications include:** Certified asthma educator, Certified COPD educator, Certified respiratory educator and Certified tobacco educator.

## CORE COMPETENCY

### **B5 Demonstrate critical thinking and reasoning skills**

---

**B5.1 Analyze the data pertinent to the clinical situation in order to make a decision**

**B5.2 Prioritize clinical activities according to the analysis of the situation**

**B5.3 Manage problems**

*These elements of Competency apply to all the Clinical Competencies.*

---

#### **B5.1 Analyze the data pertinent to the clinical situation in order to make a decision**

##### **Performance criteria**

B5.1.1 Collect data

B5.1.2 Distinguish and compare the elements of the situation

B5.1.3 Review hypotheses and reflect on the validity of arguments, statements and data

##### **Range (clarification)**

- a. this also applies to equipment

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
|--------------------------|--------------------------|---------------------|------------|
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K6, S6, A4 |

#### **B5.2 Prioritize clinical activities according to the analysis of the situation**

##### **Performance criteria**

B5.2.1 Establish a work plan

B5.2.2 Manage time and resource constraints

B5.2.3 Demonstrate prioritization and task planning skills

B5.2.4 React properly to unforeseen situations

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K6, S6, A4        |

### **B5.3 Manage problems**

#### **Performance criteria**

- B5.3.1 Identify the problem
- B5.3.2 Demonstrate problem-solving skills
- B5.3.3 Apply appropriate safety measures
- B5.3.4 Adjust reasoning to task requirements
- B5.3.4 Assess the outcome of a decision to guide future actions

#### **Range (clarification)**

- a. applies to clinical issues, system issues that directly impact the care and safety of the patient, and equipment-related problems

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (optional) |
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K6, S6, A4        |

## CORE COMPETENCY

### ***B6 Perform administrative duties***

- 
- B6.1 Use relevant computer and electronic data applications**
  - B6.2 Participate in institutional or professional meetings**
  - B6.3 Demonstrate responsible use of resources to minimize costs**
  - B6.4 Complete administrative reports**
  - B6.5 Perform assessments other than those related to patients**
  - B6.6 Assess peer/student competence and performance**
  - B6.7 Facilitate student and new staff orientation**

*These elements of Competency apply to all the Clinical Competencies.*

---

#### **B6.1 Use relevant computer and electronic data applications**

##### **Performance criteria**

- B6.1.1 Use relevant computer systems and standard applications software effectively
- B6.1.2 Understand the importance of data collection and analysis in the health care setting
- B6.1.3 Record and access data in a data management system
- B6.1.4 Analyze data in a data management system

##### **Range (clarification)**

- a. computer systems: desktop and laptop personal computers, tablets, smart phones and other communication devices
- b. standard applications software: computer operating system, intranet, internet browser, word processing, spreadsheet and analysis programs, messaging
- c. data management systems: biomedical request, computerized protocol, electronic payroll, workload measurement system, Management Information Systems in Canadian Health Service Organizations (MIS Standards)

| <b>Career Stage</b>                                | Experienced Professional                 | Senior Professional | Expert (Optional) |
|--|--|---------------------|-------------------|
| <b>Degree of Mastery</b>                           | K4, S4, A3                               | K5, S4, A4          | K6, S6, A4        |
| <b>Additional performance criteria for Experts</b> | B6.1.5 Develop new computer applications |                     |                   |

## B6.2 Participate in institutional or professional meetings

### Performance criteria

- B6.2.1 Know the goals sought by committees operating at various levels: institutional, provincial and national
- B6.2.2 Participate in a meeting or on a committee

### Range (clarification)

- a. institutional or professional meetings: professional body, professional association, committee meetings

| Career Stage      | Experienced Professional | Senior Professional | Expert     |
|-------------------|--------------------------|---------------------|------------|
| Degree of Mastery | K4, S4, A3               | K5, S5, A4          | K6, S6, A4 |

## B6.3 Demonstrate responsible use of resources to minimize costs

### Performance criteria

- B6.3.1 Understand the impact of your practice on the cost of care
- B6.3.2 Reduce waste

### Range (clarification)

- a. waste of resources: time waiting, defects/mistakes, unnecessary movement and transportation, over-production, over-processing, expired/damaged inventory

| Career Stage  | Experienced Professional   | Senior Professional | Expert (Optional) |
|---|--|---------------------|-------------------|
| Degree of Mastery   | K4, S4, A3   | K5, S5, A4          | K5, S5, A4        |
| Additional performance criteria for Senior Professional and Experts | B6.3.3 Establish or assist in the establishment of a budget<br>B6.3.4 Identify applicable measures to manage costs<br>B6.3.5 Manage physical resources of staff, equipment and space |                     |                   |

## B6.4 Complete administrative reports

### Performance criteria

- B6.4.1 Recognize the role of reporting in the health care setting
- B6.4.2 Assemble the required information
- B6.4.3 Complete and submit administrative reports accurately and on time
- B6.4.4 Review administrative reports and compare with previous reports to identify trends and exceptions, and provide feedback

B6.4.5 Complete and submit health and safety reports

**Range (clarification)**

- a. administrative reports: broken equipment reports, requisitions, discharge summaries, incident reports, workload measurement reports
- b. health and safety reports includes: hazards, incident and accident reports

**Knowledge**

- role of reporting
- format and application for reporting

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (optional) |
| <b>Degree of Mastery</b> | K3, S3, A2               | K5, S4, A4          | K5, S5, A4        |

**B6.5 Perform assessments other than those related to patients**

**Performance criteria**

B6.5.1 Assess the health care working environment

B6.5.2 Evaluate the performance of staff

**Range (clarification)**

- a. assessments other than those related to patients: for example, environment, risk management, resources, demographic data, personnel
- b. respiratory care environment: for example, workplace health and safety, risk management, incident/accident reporting

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (optional) |
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K6, S6, A4        |

**B6.6 Assess peer/student competence and performance**

**Performance criteria**

B6.6.1 Assess practice based on job description

B6.6.2 Establish clear, specific goals and objectives

B6.6.3 Perform the evaluation in accordance with the appropriate guide (for example, guide from a teaching institution, guide provided by the employer)

**Range (clarification)**

- a. appropriate assessment guide: for example, guide from a teaching institution, guide provided by the employer

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S3, A3               | K5, S5, A4          | K6, S6, A4 |

## **B6.7 Facilitate student and new staff orientation**

### **Performance criteria**

B6.7.1 Assist the on-boarding of students and new staff in accordance with the program in effect

B6.7.2 Develop a student and new staff orientation program and guide

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S5, A4          | K6, S6, A4 |

## CORE COMPETENCY

### **B7 Implement preventive measures to ensure health and safety**

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- B7.1 Analyze the risk posed by a clinical situation**
- B7.2 Apply infection prevention and control precautions**
- B7.3 Manage biohazardous materials**
- B7.4 Handle dangerous substances and materials**
- B7.5 Adhere to Canadian Standards Association (CSA) standards for medical equipment**
- B7.6 Handle medical gases/liquids safely**
- B7.7 Exercise the role of an RT in the event of an institutional disaster and mass casualty**
- B7.8 Use respiratory care equipment and supplies safely**
- B7.9 Apply the principles of the Occupational Safety, Health and Wellness (OSH&W) program**
- B7.10 Manage stress**

*These elements of Competency apply to all the Clinical Competencies.*

---

#### **B7.1 Analyze the risk posed by a clinical situation**

##### **Performance criteria**

- B7.1.1 Recognize a situation posing a risk
- B7.1.2 Assess the components' potential for harm and their probability
- B7.1.3 Identify the causes and effects and how to mitigate them
- B7.1.4 Identify any alternative strategies that could avoid the risk
- B7.1.5 Plan and implement preventive measures

##### **Knowledge**

- the measures to apply when faced with a risky situation

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
|--------------------------|--------------------------|---------------------|------------|
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K6, S6, A4 |

## B7.2 Apply infection prevention and control precautions

### Performance criteria

B7.2.1 Use proper technique for hand hygiene

B7.2.2 Perform a point of care risk assessment

B7.2.3 Apply infection prevention and control and personal protective equipment (PPE) procedures for various types of precautions

B7.2.4 Clean and disinfect equipment

### Range (clarification)

- a. various types of precautions including, but not limited to: contact, droplet, airborne

### Knowledge

- the levels of precaution and personal protective equipment required in relation to the type of care being provided for various types of micro-organisms
- the selection and effective use of equipment to prevent infection, including the function and use of bacteria filters and negative pressure rooms
- the purpose and indications for culture and sensitivity testing in respiratory care
- the methods used to clean and disinfect equipment and the issues related to each method

| Career Stage      | Experienced Professional | Senior Professional | Expert     |
|-------------------|--------------------------|---------------------|------------|
| Degree of Mastery | K5, S5, A4               | K5, S5, A4          | K6, S6, A4 |

## B7.3 Manage biohazardous materials

### Performance criteria

B7.3.1 Handle and safely dispose of biohazardous materials

### Knowledge

- common types of biohazardous materials
- safe management and handling of biohazardous materials, including storage and elimination

| Career Stage      | Experienced Professional | Senior Professional | Expert     |
|-------------------|--------------------------|---------------------|------------|
| Degree of Mastery | K5, S4, A4               | K5, S4, A4          | K5, S4, A4 |

## B7.4 Handle dangerous substances and materials

### Performance criteria

B7.4.1 Handle dangerous substances and materials in a safe manner

### Range (clarification)

- a. in a safe manner: as outlined in Workplace Hazard Information and Material System 2015, (WHMIS 2015)

### Knowledge

- categories of hazardous/dangerous substances and materials
- handling and manipulation of hazardous/dangerous substances and materials with respect to WHMIS 2015 and OSH&W
- initial procedure for injuries occurring in the workplace

|   |  |                     |                   |
|---|--|---------------------|-------------------|
| <b>Career Stage</b>   | Experienced Professional   | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b>  | K5, S4, A4   | K5, S4, A4          | K6, S4, A4        |
| <b>Additional performance criteria for Senior Professionals</b> | B7.4.2 Determine the priority and follow-up procedures for injuries occurring in the workplace |                     |                   |

## **B7.5 Adhere to Canadian Standards Association (CSA) standards for medical equipment**

### Performance criteria

B7.5.1 Utilize medical equipment in accordance with CSA norms and safety standards

### Knowledge

- the role and responsibilities of the CSA with respect to medical equipment and patient safety
- general electrical safety guidelines

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S4, A4          | K6, S4, A4 |

## **B7.6 Handle medical gases/liquids safely**

### Performance criteria

B7.6.1 Utilize and store medical gases and liquids in a safe manner

### Range (clarification)

- a. in a safe manner: according to Transport Canada regulations

### Knowledge

- sizes and formats of medical gases/liquids containers and their respective content
- the DOT/CTC regulations and procedures for handling and storing medical gases/liquids

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K5, S5, A4 |

## **B7.7 Exercise the role of RT in the event of an institutional disaster and mass casualty**

### **Performance criteria**

B7.7.1 Apply the procedures according to the institutional disaster and mass casualty plan

### **Knowledge**

- existing codes
- the role of the RT

|   |   |                     |                   |
|---|---|---------------------|-------------------|
| <b>Career Stage</b>   | Experienced Professional  | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b>  | K4, S4, A3  | K5, S5, A4          | K6, S6, A4        |
| <b>Additional performance criteria for Senior Professionals</b> | B7.7.2 Manage human and material resources when a disaster or mass casualty plan is in effect |                     |                   |

## **B7.8 Use respiratory care equipment and supplies safely**

### **Performance criteria**

B7.8.1 Prepare and assemble equipment and supplies for use

B7.8.2 Perform required preventive maintenance and quality control procedures

B7.8.3 Select the best available equipment for the required intervention

B7.8.4 Verify respiratory equipment, including alarms, according to best practice guidelines

### **Knowledge**

- the indications, contra-indications, advantages and complications of respiratory care equipment
- the safety standards related to respiratory care equipment
- formats of delivery for medical gases, including the safety features
- the care and maintenance program for equipment utilized in respiratory care, including calibration procedures and operational checks

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K5, S5, A3               | K5, S5, A4          | K5, S5, A4 |

## **B7.9 Apply the principles of the Occupational Safety, Health and Wellness (OSH&W) program**

### **Performance criteria**

B7.9.1 Apply preventive measures to maximise health and safety

**Range (clarification)**

- a. preventive measures including, but not limited to: lifts and transfers of patients, ergonomics, vaccination, violence in the workplace

**Knowledge**

- OSH&W measures

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S4, A4          | K5, S4, A4 |

**B7.10 Manage stress****Performance criteria**

- B7.10.1 Recognize and anticipate stressful situations
- B7.10.2 Identify effective resources and strategies available for managing stress
- B7.10.3 Apply strategies for reducing and managing stress
- B7.10.4 Help others to reduce and manage stress and avoid conflict

**Range (clarification)**

- a. stressful situations: at work, at home, physical and psychological circumstances that might impair judgement, performance and decision-making
- b. others: patients, families, health care professionals, inter-professional team, colleagues, employer

**Knowledge**

- major stress factors commonly encountered
- the impact of stress associated with the demands of professional practice
- strategies for stress management

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (optional) |
| <b>Degree of Mastery</b> | K5, S4, A3               | K5, S5, A4          | K6, S6, A4        |

## CORE COMPETENCY

### **B8 Demonstrate accountability appropriate to role in the health care team**

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**B8.1 Engage in projects and professional initiatives**

**B8.2 Facilitate change**

**B8.3 Support and develop the team**

*These elements of Competency apply to all the Clinical Competencies.*

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#### **B8.1 Engage in projects and professional initiatives**

##### **Performance criteria**

- B8.1.1 Involve team members to achieve objectives
- B8.1.2 Plan activities, programs and resources
- B8.1.3 Monitor progress and impact
- B8.1.4 Adapt to changes

##### **Knowledge**

- standard resource and project planning principles and techniques

| Career Stage                                | Experienced Professional                                     | Senior Professional | Expert (Optional) |
|---|--|---------------------|-------------------|
| Degree of Mastery                           | K4, S4, A3   | K5, S5, A4          | K6, S6, A4        |
| Additional performance criteria for Experts | B8.1.5 Drive progress and evolution of professional practice |                     |                   |

#### **B8.2 Facilitate change**

##### **Performance criteria**

- B8.2.1 Identify opportunities for change
- B8.2.2 Understand drivers of and obstacles to change
- B8.2.3 Apply change management principles and techniques
- B8.2.4 Monitor and evaluate the change process

##### **Range (clarification)**

- a. change: includes change of practice, change of protocols, change of organizational culture

##### **Knowledge**

- change management principles, techniques, drivers and obstacles

- organizational and professional values

|  |  |                     |                   |
|--|--|---------------------|-------------------|
| <b>Career Stage</b>                                | Experienced Professional                                     | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b>                           | K3, S4, A3   | K5, S5, A4          | K6, S6, A4        |
| <b>Additional performance criteria for Experts</b> | B8.2.5 Drive progress and evolution of professional practice |                     |                   |

### **B8.3 Support and develop the team**

#### **Performance criteria**

B8.3.1 Motivate team members

B8.3.2 Give team members support when they need it, especially during periods of setback and change

B8.3.3 Encourage members to express their ideas, opinions and concerns

B8.3.4 Build mutual trust by being fair, reliable, consistent and credible

#### **Range (clarification)**

- this competency is very wide ranging and expands the scope of all other competencies where the RT is working with others, including those from other professions
- for the Expert, the team should be considered wider than the immediate work colleagues, to include other RTs in the organization and beyond

|   |  |                     |                   |
|---|--|---------------------|-------------------|
| <b>Career Stage</b>   | Experienced Professional   | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b>  | K3, S3, A3   | K5, S5, A4          | K6, S6, A4        |
| <b>Additional performance criteria for Senior Professionals</b> | B8.3.5 Encourage team members to take responsibility for their own development needs |                     |                   |

## **CLINICAL COMPETENCIES**

## CLINICAL COMPETENCY

### *C1 Assess patient's cardio respiratory status*

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**C1.1 Collect pertinent information**

**C1.2 Analyze the collected information**

**C1.3 Interpret the collected data**

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#### **C1.1 Collect pertinent information**

##### **Performance criteria**

C1.1.1 Obtain a comprehensive patient history

C1.1.2 Observe the clinical manifestations

C1.1.3 Utilize invasive and non-invasive monitoring

C1.1.4 Take note of pertinent diagnostic tests

##### **Range (clarification)**

- a. non-invasive monitors including, but not limited to: transcutaneous O<sub>2</sub> and CO<sub>2</sub>, end-tidal CO<sub>2</sub>, pulse oximetry, ventilatory parameters, blood pressure
- b. invasive monitoring including, but not limited to: hemodynamics, ventilatory parameters
- c. comprehensive patient history: patient charts, co-morbidities, patient and family interview, shift reports
- d. relevant diagnostic results including, but not limited to: diagnostic imaging, laboratory, pulmonary function, sleep studies, ECG, walking oximetry test

##### **Knowledge**

- the differences between objective and subjective data and between signs and symptoms
- normal and abnormal findings related to head to toe inspection, palpation, percussion (if applicable) and auscultation (examples: respiratory pattern and rate, digital clubbing, level of consciousness, cyanosis)
- appropriate sites used to assess pulse and blood pressure
- normal and abnormal values related to pulse and blood pressure
- non-invasive blood pressure measurement using both manual and automatic techniques
- the technical and clinical characteristics of a normal and abnormal chest radiograph
- correct position of an artificial airway device on a chest radiograph
- the abnormalities in a chest radiograph in common diseases/disorders
- pulmonary imaging techniques (examples: computed tomography, magnetic resonance imaging and angiography, ultrasound)
- normal and abnormal findings measures obtained from non-invasive monitoring
- the appropriate application sites for non-invasive monitoring
- the applications, indications and contraindications of each intervention, procedure or medication given to the patient
- the complications of the interventions, procedures or medication and their corrective action

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
|--------------------------|--------------------------|---------------------|------------|
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S5, 4           | K5, S5, A4 |

## **C1.2 Analyze the collected information**

### **Performance criteria**

C1.2.1 Compare obtained information with normal values

#### **Knowledge**

- normal values

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
|--------------------------|--------------------------|---------------------|------------|
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K5, S5, A4 |

## **C1.3 Interpret the collected data**

### **Performance criteria**

C1.3.1 Establish a relationship between the data and the patient's clinical status

C1.3.2 Assess the accuracy and quality of the data

| <b>Career Stage</b>  | Experienced Professional                       | Senior Professional | Expert (Optional) |
|--|--|---------------------|-------------------|
| <b>Degree of Mastery</b>   | K5, S5, A4                                     | K5, S5, A4          | K5, S5, A4        |
| <b>Additional performance criteria for Experienced Professionals</b> | C1.3.2 Develop respiratory treatment protocols |                     |                   |

## CLINICAL COMPETENCY

### C2 Optimize Patient Safety

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**C2.1 Contribute to a culture of patient safety**

**C2.2 Manage patient safety risks**

**C2.3 Respond to and report patient safety incidents**

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#### C2.1 Contribute to a culture of patient safety

##### Performance criteria

C2.1.1 Apply evidence-informed practice

C2.1.2 Maintain and enhance quality of practice through ongoing learning

C2.1.3 Refer to guidelines for optimal practice in the administration of care

##### Knowledge

- recognized terminology associated with the area of patient safety
- terminology that optimizes patient safety and difference between policies, guidelines, and protocols
- fundamental elements of patient safety

| Career Stage      | Experienced Professional | Senior Professional | Expert     |
|-------------------|--------------------------|---------------------|------------|
| Degree of Mastery | K5, S5, A4               | K5, S5, A4          | K6, S6, A4 |

#### C2.2 Manage patient safety risks

##### Performance criteria

C2.2.1 Identify situations or environments involving risks to patient safety

C2.2.2 Recognize the factors that can affect RT performance and impact the patient

C2.2.3 Implement solutions to these patient safety issues

C2.2.4 Assess the effectiveness of these solutions and make corrections as needed

C2.2.5 Where indicated, use technology to optimize practice

| Career Stage                                | Experienced Professional   | Senior Professional | Expert (Optional) |
|---|--|---------------------|-------------------|
| Degree of Mastery                           | K5, S5, A4   | K5, S5, A4          | K6, S6, A4        |
| Additional performance criteria for Experts | C2.2.6 Identify process or system gaps involving risks to patient safety |                     |                   |

### **C2.3 Respond to and report patient safety incidents**

#### **Performance criteria**

- C2.3.1 Manage immediate risks for patients and others affected
- C2.3.2 Disclose the occurrence of a patient safety incident. This may include the patient, supervisor, employer, relevant authorities to the patient and/or their families in keeping with relevant legislation
- C2.3.5 Take part in timely event analysis, reflective practice and planning to prevent recurrence

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
|--------------------------|--------------------------|---------------------|------------|
| <b>Degree of Mastery</b> | K5, S4, A3               | K5, S5, A4          | K6, S5, A4 |

## CLINICAL COMPETENCY

### ***C3 Administer medication and substances***

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**C3.1 Determine appropriateness and safety of medication and substances**

**C3.2 Prepare medication and substances for administration**

**C3.3 Administer medication and substances**

**C3.4 Evaluate response to medication or substance administration**

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#### **C3.1 Determine appropriateness and safety of medication and substances**

##### **Performance criteria**

C3.1.1 Verify that the medication order or prescription is complete or that the patient meets inclusion criteria for use of protocol

C3.1.2 Assess appropriateness of the prescribed medication for the patient

C3.1.3 Verify patient has no known allergy or previous adverse response to the medication

##### **Range (clarification)**

- a. medication: for example, bronchodilators, benzodiazepines, narcotics, prostacyclins, antibiotics, etc
- b. substance: for example, blood, plasma crystalloid substance
- c. protocol: includes algorithm and pathway
- d. routes of enteral and parenteral administration, such as substances by inhalation, instillation, orally, transdermal, topical, injection and infusion

##### **Knowledge**

- elements of a valid prescription or medical order
- indications and contraindications of medications and substances
- adverse responses to medications and substances
- the available formats and methods of administration

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S5, A4          | K5, S5, A4        |

### C3.2 Prepare medications and substances for administration

#### Performance criteria

C3.2.1 Perform dosage calculations

C3.2.2 Safely prepare medications following monograph and workplace hazard best practice guidelines

C3.2.3 Ensure proper labeling and handling of prepared medications and substances according to best practice standards

#### Range (clarification)

- administration of: substances by inhalation, instillation, orally, topical, transdermal, injection and infusion
- monograph: information provided by the drug manufacturer to the health care team
- workplace hazard best practice guidelines: Global Harmonization System (formerly Workplace Hazard Information and Material System)

#### Knowledge

- dosages and concentrations of medications and substances
- independent double check

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K5, S4, A4               | K5, S4, A4          | K5, S5, A4        |

### C3.3 Administer medications and substances

#### Performance criteria

C3.3.1 Verify the right client, right medication or substance, right reason, right dose, right frequency, right route, right site, right time and right documentation

C3.3.2 Administer substance using the appropriate format, method of administration and proper technique

C3.3.3 If client or legal guardian administers medication or substance, assess that medication is administered correctly

C3.3.4 Perform appropriate documentation of medication or substance administration

#### Range (clarification)

- administration of: substances by inhalation, instillation, orally, transdermal, injection, infusion
- includes administration of medical gases and surfactants
- medical gases do not apply to inhaled anaesthetic agents, because these are covered under the Anaesthesia Competency
- according to provincial and territorial scope of practice, “surfactants” may be either “administered” or the RT may “assist” with administration

#### Knowledge

- indications, contraindications and complications
- technique and dosages for surfactant administration

- recommended applications and administration procedure for each medical gas
- delivery systems for various medical gases (for example, oxygen, nitric oxide, heliox)

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K5, S5, A4        |

### **C3.4 Evaluate response to medication or substance administration**

#### **Performance criteria**

C3.4.1 Assess the patient’s response

C3.4.2 Adjust medication or substance dose or rate according to order or protocol

#### **Range (clarification)**

- protocol: includes algorithm and pathway

#### **Knowledge**

- responses to medications: desired effects, side effects, allergic responses

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K5, S5, A4        |

## CLINICAL COMPETENCY

### ***C4 Manage airway***

---

#### **C4.1 Manage artificial airway devices**

#### **C4.2 Ensure patency of the airway**

---

#### **C4.1 Manage artificial airway devices**

##### **Performance criteria**

- C4.1.1 Select the appropriate artificial airway device
- C4.1.2 Optimize patient position
- C4.1.3 Insert the artificial airway device correctly
- C4.1.4 Maintain artificial airway devices
- C4.1.5 Remove artificial airway device at the appropriate time
- C4.1.6 Assist with inserting an artificial airway device using specialized and complementary techniques, if necessary
- C4.1.7 Assist with airway device change if necessary, while maintaining patent airway and adequate ventilation
- C4.1.8 Perform surgical airway care, including tracheostomy care
- C4.1.9 Apply a speaking valve

##### **Range (clarification)**

- a. artificial airway devices, for example: endotracheal tube, tracheostomy tube, laryngeal mask, oropharyngeal and nasopharyngeal airway, laryngectomy
- b. context for application of speaking valves: clinical setting, at home

##### **Knowledge**

- procedures and techniques for inserting artificial airway devices in various clinical situations, including changing the airway
- techniques and equipment (laryngoscope, video laryngoscope, bougie or any equipment used when inserting an artificial airway device)
- indicators of proper tube placement
- possible complications and corrective actions to take with airway management
- indicators for the need to change or remove an artificial airway device
- procedures and techniques for removing an artificial airway device
- situations and corrective actions related to difficult airway situations
- tracheostomy procedure
- technique for tracheostomy care
- procedures for tracheostomy weaning and corking
- procedures for laryngectomy and laryngectomy weaning
- methods used to allow patients with a tracheostomy to communicate

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K5, S5, A4        |

## C4.2 Ensure patency of the airway

### Performance criteria

- C4.2.1 Optimize broncho-pulmonary hygiene
- C4.2.2 Perform lung volume recruitment techniques
- C4.2.3 Provide humidity therapy
- C4.2.4 Assist with bronchoscopy procedures

### Range (clarification)

- a. with or without an artificial airway

### Knowledge

- techniques used in selected suction therapy (nasopharyngeal, oropharyngeal, endotracheal)
- methods used to obtain sputum samples
- positions used to facilitate broncho-pulmonary hygiene
- directed cough, assisted cough, percussion and postural drainage technique
- mechanical or pneumatic devices (for example: PEP devices, Cough Assist, Intrapulmonary Percussive Ventilation (IPV))
- physiological techniques (for example, breath stacking)
- pneumatic techniques (for example, IPPB, modified resuscitator device)
- the physiological importance of humidity and the significance of a humidity deficit in the respiratory tract
- the physiological effects of heated or non-heated humidification
- sample collection
- purpose of various drugs commonly used during a bronchoscopy
- methods of obtaining and preparing samples during a bronchoscopy
- modifications required for an intubated patient

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K5, S5, A4        |

## CLINICAL COMPETENCY

### **C5 Perform anaesthesia assistance**

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**C5.1 Assist with anaesthesia**

**C5.2 Manage homeostasis of a patient during anaesthesia**

**C5.3 Manage the patient during sedation**

---

#### **C5.1 Assist with anaesthesia**

##### **Performance criteria**

- C5.1.1 Assess patient general status (American Society of Anesthesiologists (ASA) status) and verify urgency of procedure
- C5.1.2 Evaluate patient airway prior to induction
- C5.1.3 Assist in positioning patient for surgery
- C5.1.4 Monitor patient during anaesthesia
- C5.1.5 Prepare the patient for emergence
- C5.1.6 Assist the anaesthesiologist during emergence

##### **Range (clarification)**

- a. in the operating room or satellite areas (for example, radiology suite, birthing center)
- b. anaesthesia includes regional, general, induction, maintenance and emergence

##### **Knowledge**

- differences between general and regional anaesthesia procedures, including clinical indications and contraindications
- complications associated with general and regional anaesthesia procedures and corrective actions
- pre-anaesthetic preparation
- changes to anaesthesia management for patients with specific considerations (for example, heart disease, pregnancy, full stomach and day surgery cases)
- differences between various surgical positions and influence on anaesthetic techniques
- positions for the different surgeries
- precautions per specific location and environment when anaesthetic procedure is performed outside of operating room, as well as with staff untrained in anaesthetic considerations
- elements of emergence from anaesthesia, including potential complications and corrective action
- drugs and dosages for medication used during emergence

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K5, S4, A4               | K5, S5, A4          | K5, S5, A4        |

## C5.2 Manage homeostasis of a patient during anaesthesia

### Performance criteria

C5.2.1 Adjust fluid and blood administration in anaesthetized patients per surgical requirement

C5.2.2 Apply appropriate devices to maintain thermal regulation

### Range (clarification)

- according to provincial and territorial scope of practice, “manage homeostasis” may mean “to assist with” in some jurisdictions

### Knowledge

- physiological monitoring of patients during anaesthesia according to Canadian Anaesthesiologist Society (CAS) guidelines
- physiological response to anaesthesia or surgical stimulation
- changes to anaesthesia management for patients with specific considerations (for example, heart disease, pregnancy and day surgery cases)
- drug dosages to provide a steady state of anaesthesia
- fluid requirements according to the type of surgery
- types of fluid/blood replacement
- clinical indications and complications associated with blood products
- blood product administration procedure, including cross match and compatibility testing
- complications from anaesthesia and their treatment (for example, hypovolemia, anaphylaxis, malignant hyperthermia, transfusion reaction)

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K5, S4, A4               | K5, S5, A4          | K5, S5, A4        |

## C5.3 Manage the patient during sedation

### Performance criteria

C5.3.1 Assess patient’s general status

C5.3.2 Evaluate patient’s airway prior to sedation

C5.3.3 Assist anaesthesiologist during sedation or perform analgesic sedation

### Range (clarification)

- according to provincial and territorial scope of practice, “manage the patient” may mean “to assist with” in some jurisdictions

**Knowledge**

- analgesic sedation anaesthesia, including its specific applications and potential complications
- anaesthetic drugs commonly utilized in analgesic sedation and their dosages

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S5, A4          | K5, S5, A4        |

## CLINICAL COMPETENCY

### **C6 Provide optimal ventilation assistance**

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#### **C6.1 Perform manual ventilation**

#### **C6.2 Provide qualitative invasive and non-invasive mechanical ventilation support**

#### **C6.3 Perform non-invasive lung volume recruitment techniques**

---

#### **C6.1 Perform manual ventilation**

##### **Performance criteria**

- C6.1.1 Select the appropriate mask and/or artificial airway device
- C6.1.2 Utilize proper technique for manual ventilation
- C6.1.3 Verify effective ventilation
- C6.1.4 Perform manual ventilation in a manner appropriate to the clinical situation

##### **Range (clarification)**

- a. resuscitator: self-inflating, flow-inflating, T-piece resuscitator
- b. manual ventilation: via mask, via artificial airway device using a resuscitator

##### **Knowledge**

- factors affecting the delivered oxygen concentration and lung volume when ventilating a patient with a manual resuscitator
- techniques for manual ventilation using a mask or an artificial airway device using a manual resuscitator
- application of manual ventilation using a self-inflating manual resuscitator versus that of a flow-inflating manual resuscitator, T-piece resuscitator

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K5, S5, A4        |

#### **C6.2 Provide optimal invasive and non-invasive mechanical ventilation support**

##### **Performance criteria**

- C6.2.1 Initiate Positive Pressure Ventilation (PPV)
- C6.2.2 Maintain PPV
- C6.2.3 Wean from PPV
- C6.2.4 Monitor and interpret ventilator waveforms and pulmonary mechanics

### C6.2.5 Initiate and maintain alternative modes of mechanical ventilation

#### Range (clarification)

- a. applies to non-invasive mechanical ventilation (NIPPV), invasive mechanical ventilation
- b. applies to all patient groups, including neonates
- c. includes all those modes that are appropriate to the patient group and the clinical situation, such as: assist-control ventilation (A/C), pressure-control ventilation (PCV), pressure support ventilation (PSV), synchronized intermittent mandatory ventilation (SIMV), volume support (VS), pressure regulated volume controlled ventilation (PRVC), airway pressure release ventilation (APRV), CPAP, bi-level ventilation
- d. functional characteristics of ventilator waveforms and pulmonary mechanics such as: auto-peep, air trapping, lower and upper inflection points, auto triggering, patient triggering, plateau pressure, static and dynamic compliance, resistance, expiratory pause, occlusion pressure
- e. alternative modes of mechanical ventilation, such as: high frequency oscillatory ventilation (HFOV), Jet ventilation, neurally-adjusted ventilatory assist (NAVA), proportional assist ventilation (PAV)

#### Knowledge

- how PPV affects patient physiology
- PPV set-up and strategies as they apply to treatment of respiratory patho-physiologies
- conventional modes of PPV
- the control schemes of a mechanical ventilator
- the fundamental elements associated with spontaneous breathing and positive pressure breaths, the initiation and termination of a positive pressure breath
- methods used to measure flow, pressure and volume in a PPV device
- set parameters of the different modes of ventilation
- how changes in patient conditions (for example, compliance and resistance) affect ventilation when using distinct modes of PPV
- the concept of compressible volume loss in a circuit and the implication in ventilation
- the indicators to predict success for weaning and discontinuation from PPV
- the functional characteristics of the lungs and airways that can be determined from specific waveforms and pulmonary mechanics
- methods utilized to evaluate pulmonary mechanics

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K5, S5, A4               | K5, S5, A4          | K6, S5, A4        |
| C6.2.5            | K3, S3, A4               | K4, S4, A4          | K5, S4, A4        |

### C6.3 Perform non-invasive lung volume recruitment techniques

#### Performance criteria

- C6.3.1 Determine goals and strategies for lung volume recruitment manoeuvres
- C6.3.2 Perform lung volume recruitment on patients using the chosen technique

**Knowledge**

- indications, contraindications and complications
- incentive spirometry technique
- physiological techniques (for example, breath stacking)
- pneumatic techniques (for example, IPPB, modified resuscitator device)

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K5, S5, A4        |

## CLINICAL COMPETENCY

### C7 Execute Resuscitation

- 
- C7.1 Perform distinction, assessment and rapid intervention as per resuscitation guidelines
  - C7.2 Perform basic life support (BLS) protocols according to the current standards of the Heart and Stroke Foundation of Canada
  - C7.3 Perform adult advanced life support (ACLS) protocols according to the current standards of the Heart and Stroke Foundation of Canada
  - C7.4 Perform paediatric advanced life support (PALS) protocols according to the current standards of the Heart and Stroke Foundation of Canada
  - C7.5 Perform neonatal resuscitation program (NRP) protocols according to the current standards of the Canadian Paediatric Society

**Note:** There are no performance criteria or knowledge statements for this competency, as it is all covered within the above certifications.

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#### C7.1 Perform distinction, assessment and rapid intervention as per resuscitation guidelines

##### Range (clarification)

- a. examples may include: ATLS, STABLE, ACORN, PALS/APLS, BLS, ACLS, and NRP

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K5, S4, A4               | K5, S5, A4          | K5, S5, A4        |

#### C7.2 Perform basic life support (BLS) protocols according to the current standards of the Heart and Stroke Foundation of Canada

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K5, S5, A4               | K5, S5, A4          | K5, S5, A4        |

**C7.3 Perform adult advanced life support (ACLS) protocols according to the current standards of the Heart and Stroke Foundation of Canada**

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K6, S6, A4        |

**C7.4 Perform paediatric advanced life support (PALS) protocols according to the current standards of the Heart and Stroke Foundation of Canada**

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K6, S6, A4        |

**C7.5 Perform neonatal resuscitation program (NRP) protocols according to the current standards of the Canadian Paediatric Society**

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b> | K5, S5, A4               | K5, S5, A4          | K6, S6, A4        |

## CLINICAL COMPETENCY

### C8 Administer cardio-pulmonary diagnostic tests

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**C8.1 Perform and interpret electrocardiograms**

**C8.2 Perform and interpret pulmonary function testing**

**C8.3 Perform diagnostic tests for sleep related breathing disorders**

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#### C8.1 Perform and interpret electrocardiograms

##### Performance criteria

C8.1.1 Perform an electrocardiogram to accepted standards

C8.1.2 Assess the validity and quality of the results and recognize any artifact(s)

C8.1.3 Interpret results

##### Range (clarification)

- a. ECG: 3-Lead, 5-Lead, 12-Lead, Holter monitoring, cardiac stress tests

##### Knowledge

- see S7: cardiovascular pathophysiology

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K5, S4, A4               | K5, S5, A4          | K5, S5, A4        |

#### C8.2 Perform and interpret pulmonary function testing

##### Performance criteria

C8.2.1 Perform pulmonary function testing to accepted standards

C8.2.2 Assess the validity and quality of the results

C8.2.3 Interpret the results

##### Range (clarification)

- a. lung volume testing: for example, flow transducer, impulse oscillation system

##### Knowledge

- See S6: pulmonary pathophysiology

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K4, S4, A4               | K5, S5, A4          | K5, S5, A4        |

### **C8.3 Perform diagnostic tests for sleep related breathing disorders**

#### **Performance criteria**

C8.3.1 Prepare the patient for appropriate monitoring

C8.3.2 Assess the validity and quality of the results

C8.3.3 Interpret the results

#### **Range (clarification)**

- a. basic sleep studies: for example, overnight oximetry, portable monitoring

#### **Knowledge**

- parameters recorded during a sleep study and their significance

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K4, S4, A4               | K4, S4, A4          | K5, S5, A4        |

## CLINICAL COMPETENCY

### C9 Perform Adjunct Therapies

---

- C9.1 Insert oesophageal or gastric tubes
  - C9.2 Assist in thoracic suction or drainage therapy
  - C9.3 Provide thermal regulation
  - C9.4 Manage transport of a patient
- 

#### C9.1 Insert oesophageal or gastric tubes

##### Performance criteria

- C9.1.1 Perform the insertion of an oesophageal tube in a patient and ensure safe positioning
- C9.1.2 Perform gastric suction/drainage in patients
- C9.1.3 Remove the oesophageal tube from patients

##### Range (clarification)

- a. insertion of a NAVA probe
- b. oesophageal balloon
- c. oro/nasogastric tubes

##### Knowledge

- indications, contraindications and complications
- the physiological effects of gastric suction/drainage
- indicators of proper tube positioning

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K3, S4, A4               | K3, S4, A4          | K3, S4, A4        |

#### C9.2 Assist in thoracic suction or drainage therapy

##### Performance criteria

- C9.2.1 Prepare the patient for thoracic suction or drainage
- C9.2.2 Assist in the insertion of a chest tube or drain

### C9.2.3 Maintain thoracic suction or drainage in patients

#### Knowledge

- indications, contraindications and complications
- thoracic suction/drainage equipment
- physiological effects associated with thoracic suction and drainage
- thoracentesis techniques and urgent needle decompression technique
- chest tube/drain insertion technique
- procedure for inserting a chest drain

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K5, S4, A4               | K5, S4, A4          | K5, S4, A4        |

### C9.3 Provide thermal regulation

#### Performance criteria

C9.3.1 Use various methods to regulate body temperature

#### Range (clarification)

- a. this applies to all practice settings: for example, OR, ER, ICU

#### Knowledge

- the benefits and drawbacks of various thermoregulation devices: for example, incubators, warming tables, heated humidifiers

| Career Stage      | Experienced Professional | Senior Professional | Expert (Optional) |
|-------------------|--------------------------|---------------------|-------------------|
| Degree of Mastery | K4, S4, A4               | K4, S4, A4          | K4, S4, A4        |

### C9.4 Manage transport of a patient

#### Performance criteria

C9.4.1 Prepare a patient for transport

C9.4.2 Monitor and maintain patient throughout transport

C9.4.3 Ensure safe delivery/handover of the patient post-transport

#### Range (clarification)

- a. patient: ventilated, non-ventilated
- b. internal, external transports

#### Knowledge

- necessary precautions and contingency plans required when transporting a patient

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S4, A4          | K6, S6, A4        |

## CLINICAL COMPETENCY

### *C10 Perform invasive vascular procedures*

---

- C10.1 Manage vascular access through invasive procedures**
  - C10.2 Manage arterial lines**
  - C10.3 Perform an arterial, venous or capillary puncture**
  - C10.4 Assist with vascular access through central lines/pulmonary artery catheter**
  - C10.5 Collect samples using indwelling catheter**
- 

#### **C10.1 Manage vascular access through invasive procedures**

##### **Performance criteria**

- C10.1.1 Explain the procedure to the patient
- C10.1.2 Select and use appropriate equipment in relation to the clinical situation
- C10.1.3 Perform the procedure appropriately

##### **Range (clarification)**

- a. according to provincial and territorial scope of practice, “manage” may include “inserting, withdrawing, repositioning”
- b. may include: intravenous, intra-osseous, umbilical venous catheter

##### **Knowledge**

- sites, procedures and techniques for vascular access
- complications
- equipment or technique to facilitate the procedure

| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Degree of Mastery</b> | K4, S4, A3               | K5, S4, A4          | K5, S4, A4        |

#### **C10.2 Manage arterial lines**

##### **Performance criteria**

- C10.2.1 Explain the procedure to the patient
- C10.2.2 Select and use appropriate equipment in relation to the clinical situation
- C10.2.3 Perform the procedure appropriately

**Knowledge**

- the sites, procedure and positioning for insertion of arterial lines or arterial puncture
- complications
- the equipment or technique to facilitate the procedure

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (optional) |
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S5, A4          | K5, S5, A4        |

**C10.3 Perform an arterial, venous or capillary puncture****Performance criteria**

C10.3.1 Select and use the appropriate equipment and prepare site

C10.3.2 Perform the procedure appropriately

**Knowledge**

- the methods and sites for obtaining a blood sample from capillary, venous or arterial puncture
- complications
- the equipment or technique to facilitate the procedure

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S5, A4          | K5, S5, A4        |

**C10.4 Assist with vascular access through central lines/pulmonary artery catheter****Performance criteria**

C10.4.1 Prepare the patient for central line/ pulmonary artery (PA) line insertion

C10.4.2 Select and prepare the appropriate equipment and sterile field

C10.4.3 Manage equipment to ensure proper function

C10.4.4 Assist with performance, as required

**Knowledge**

- conscious sedation anaesthesia, including its specific applications
- sites and techniques for central line cannulation and pulmonary artery catheterization
- complications
- the equipment or technique to facilitate the procedure
- the normal values and calculations related to central venous and pulmonary artery catheters
- ventilatory effect on the various pulmonary hemodynamic pressures
- different hemodynamic pressure waveforms

|                          |                          |                     |                   |
|--------------------------|--------------------------|---------------------|-------------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert (Optional) |
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S4, A4          | K5, S4, A4        |

### **C10.5 Collect samples using an indwelling catheter**

#### **Performance criteria**

C10.5.1 Prepare the patient

C10.5.2 Select and use the appropriate equipment

C10.5.3 Perform the procedure appropriately

#### **Range**

- a. indwelling catheter: arterial, pulmonary artery, central venous or umbilical

#### **Knowledge**

- methods for obtaining samples from indwelling catheters, including zeroing and levelling of the transducer
- complications with sampling from indwelling catheters, and treatment of complications
- methods used for transporting blood samples
- quality control for blood gas analysis
- procedure used to perform sample analysis
- handling samples

|                          |                          |                     |            |
|--------------------------|--------------------------|---------------------|------------|
| <b>Career Stage</b>      | Experienced Professional | Senior Professional | Expert     |
| <b>Degree of Mastery</b> | K5, S4, A4               | K5, S5, A4          | K5, S5, A4 |

## **FOUNDATION SCIENCE**

## FOUNDATION SCIENCE

### *S1 Apply knowledge of anatomy and physiology*

---

- S1.1 Apply the appropriate scientific knowledge relating to the organization and function of the human body
  - S1.2 Apply the appropriate scientific knowledge relating to the stages of prenatal development
  - S1.3 Apply the appropriate scientific knowledge relating to skin, bones and muscles
  - S1.4 Apply the appropriate scientific knowledge relating to the nervous system: its regulation and integration of the physiological processes
  - S1.5 Apply the appropriate scientific knowledge relating to homeostasis and the role of each contributing system
  - S1.6 Apply the appropriate scientific knowledge relating to the urinary system
  - S1.7 Apply the appropriate scientific knowledge relating to fluid equilibrium, electrolytes and acid-base balance
  - S1.8 Apply the appropriate scientific knowledge relating to the endocrine system
  - S1.9 Apply the appropriate scientific knowledge relating to the pulmonary system
  - S1.10 Apply the appropriate scientific knowledge relating to pulmonary ventilation
  - S1.11 Apply the appropriate scientific knowledge relating to the neurological control of breathing and respiratory compensation
  - S1.12 Apply the appropriate scientific knowledge relating to the functional physiology of blood
  - S1.13 Apply appropriate scientific knowledge relating to gas exchanges
  - S1.14 Apply the appropriate scientific knowledge relating to the functional physiology of the cardiovascular system
  - S1.15 Apply appropriate scientific knowledge relating to the electrophysiology of the heart
- 

### **S1.1 Apply the appropriate scientific knowledge relating to the organization and function of the human body**

#### **Knowledge**

- chemical processes needed for the function of human physiology
- the cellular mechanism as a fundamental and essential unit
- the functions of the principal human tissues

### **S1.2 Apply the appropriate scientific knowledge relating to the stages of prenatal development**

#### **Knowledge**

- the stages of pregnancy and delivery
- the events of embryonic and fetal development
- the newborn's adaptation to extra-uterine life

### **S1.3 Apply the appropriate scientific knowledge relating to skin, bones and muscles**

#### **Knowledge**

- the integumentary system
- the structure and function of the bones
- the structure and function of the muscles
- the changes and consequences of aging on the bones and muscles

### **S1.4 Apply the appropriate scientific knowledge relating to the nervous system: its regulation and integration of the physiological processes**

#### **Knowledge**

- the structure and physiology of the nervous tissue
- the function of the central nervous system
- the function of the peripheral nervous system and the reflex activity
- the function of the autonomic nervous system
- the changes and consequences of aging on the nervous system

### **S1.5 Apply the appropriate scientific knowledge relating to homeostasis and the role of each contributing system**

#### **Knowledge**

- the composition and characteristics of venous and arterial blood
- the functions of the lymphatic system
- the functions of the immune system
- the overall function of digestive system
- the metabolism and function of the liver
- the thermoregulatory mechanism with emphasis on the newborn

### **S1.6 Apply the appropriate scientific knowledge relating to the urinary system**

#### **Knowledge**

- the anatomy of the kidney
- the mechanism of urine formation
- the functions of the urinary system in relation to the maintenance of homeostasis

### **S1.7 Apply the appropriate scientific knowledge relating to fluid equilibrium, electrolytes and acid-base balance**

#### **Knowledge**

- the regulation of water balance
- the regulation of electrolytes: sodium, potassium, calcium, magnesium and anions
- acid-base balance: chemical buffer systems, respiratory regulation and renal mechanisms

### **S1.8 Apply the appropriate scientific knowledge relating to the endocrine system**

#### **Knowledge**

- the major endocrine organs
- the functional role of the major endocrine organs: pituitary, thyroid, parathyroid, adrenal, pineal and thymus glands

### **S1.9 Apply the appropriate scientific knowledge relating to the pulmonary system**

#### **Knowledge**

- each component of the pulmonary system
- the relationship between the pulmonary system and the other systems
- the changes to the pulmonary system throughout the course of life

### **S1.10 Apply the appropriate scientific knowledge relating to pulmonary ventilation**

#### **Knowledge**

- the principles of physics in relation to pulmonary ventilation
- the functionality of inhalation and exhalation during one breath cycle
- the function of external respiration
- lung volumes and lung capacities

### **S1.11 Apply the appropriate scientific knowledge relating to the neurological control of breathing and respiratory compensation**

#### **Knowledge**

- the regulation of breathing
- the types of respiratory patterns
- the reflex actions triggered by blood and pulmonary receptors
- other factors which influence respiratory frequency and amplitude
- the various mechanisms known to contribute to respiratory compensation

### **S1.12 Apply the appropriate scientific knowledge relating to the functional physiology of blood**

#### **Knowledge**

- the biochemical profile of venous and arterial blood
- the composition of plasma and its components
- the mechanism of blood coagulation
- the principle of blood transfusion, cell saving and restoration of blood volume
- the flow and function of the pulmonary circulation and the systemic circulation

### **S1.13 Apply appropriate scientific knowledge relating to gas exchanges**

#### **Knowledge**

- the composition of atmospheric gases, alveolar gases and blood gases
- gas exchange between blood, the lungs and the tissues
- how gases are transported in the blood
- anatomical and physiological factors known to affect gas exchange

### **S1.14 Apply the appropriate scientific knowledge relating to the functional physiology of the cardiovascular system**

#### **Knowledge**

- the anatomy and function of the heart as an integral part of the cardiovascular system
- the electromechanical physiology pertaining to each functional phase of a cardiac cycle
- the physiology of blood circulation during one complete cardiac cycle
- the changes and consequences of aging on the cardiovascular system

### **S1.15 Apply appropriate scientific knowledge relating to the electrophysiology of the heart**

#### **Knowledge**

- the neuro-chemical control of the cardiovascular system
- the intrinsic conduction system and the extrinsic innervation of the heart
- graphic recording of electrical changes on an electrocardiogram during various heart activities

## FOUNDATION SCIENCE

### **S2 Apply knowledge of chemistry and biochemistry**

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**S2.1 Apply the appropriate scientific knowledge relating to chemical terms and concepts as they pertain to Respiratory Therapy**

**S2.2 Apply the appropriate scientific knowledge relating to biochemical terms and concepts as they pertain to Respiratory Therapy**

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#### **S2.1 Apply the appropriate scientific knowledge relating to chemical terms and concepts as they pertain to Respiratory Therapy**

##### **Knowledge**

- element, atom, nucleus, proton, neutron, electron, valence and isotope
- atomic number, atomic weight, molecular weight
- chemical compound, molecule
- ion, cation, anion, electrolyte and salt
- chemical bonds - ionic and covalent compounds
- oxidation and reduction
- kinetic energy, potential energy and gradient
- anabolism and catabolism
- organic, inorganic compounds
- equilibrium
- reversible reaction
- law of mass action
- water as a universal solvent, physical characteristics of water and hydrogen bonding
- hydrolysis reaction
- dissociation
- enzyme
- pH, acid and base
- cathode, anode, electrode, voltage, current and resistance

#### **S2.2 Apply the appropriate scientific knowledge relating to biochemical terms and concepts as they pertain to Respiratory Therapy**

##### **Knowledge**

- mixture, solution, solvent, solute, crystalloid, colloid and suspension
- strong acid, strong base
- acidosis and acidemia
- alkalosis and alkalemia
- fixed acid

- volatile acid
- buffers – chemical buffers, closed buffer systems and open buffer systems
- conjugate base
- amphoteric compound or molecule
- law of electro-neutrality and anion gap
- gradient, diffusion, osmosis, facilitated diffusion, filtration and active transport

## FOUNDATION SCIENCE

### **S3 Apply knowledge of physics**

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- S3.1 Apply the appropriate scientific knowledge relating to the behaviour of gases**
  - S3.2 Apply the appropriate scientific knowledge relating to the states of matter and change of state**
  - S3.3 Apply the appropriate scientific knowledge relating to surface tension**
  - S3.4 Apply the appropriate scientific knowledge relating to gas diffusion**
  - S3.5 Apply the appropriate scientific knowledge relating to fluid dynamics and gas mixing/entrainment**
  - S3.6 Apply the appropriate scientific knowledge relating to the behaviour of aerosols**
  - S3.7 Apply the appropriate scientific knowledge relating to other physical principles**
- 

#### **S3.1 Apply the appropriate scientific knowledge relating to the behaviour of gases**

##### **Knowledge**

- potential and kinetic energy
- Avogadro's law
- Boyle's, Charles', Gay-Lussac's laws
- Combined and Ideal Gas laws
- pressure: units of measure and conversion factors
- volume: units of measure and conversion factors

#### **S3.2 Apply appropriate scientific knowledge relating to the states of matter and change of state**

##### **Knowledge**

- melting point and boiling point
- critical temperature, critical pressure and filling density
- evaporation, surface area and contact time
- vapour and vapour pressure
- latent heat of vaporisation (fusion)
- humidity, absolute humidity, relative humidity and humidity deficit
- condensation and dew point

- STPD, ATPS and BTPS

### **S3.3 Apply the appropriate scientific knowledge relating to surface tension**

#### **Knowledge**

- Laplace's law
- capillary action
- cohesion and adhesion

### **S3.4 Apply the appropriate scientific knowledge relating to gas diffusion**

#### **Knowledge**

- atmospheric composition and its gases
- Dalton's law of partial pressures
- Graham's law
- Henry's law
- solubility co-efficient
- Fick's law of diffusion

### **S3.5 Apply the appropriate scientific knowledge relating to fluid dynamics and gas mixing/entrainment**

#### **Knowledge**

- Poiseuille's law
- Reynold's number
- laminar and turbulent Flow
- Bernoulli principle
- Venturi effect
- Coanda effect

### **S3.6 Apply the appropriate scientific knowledge relating to the behaviour of aerosols**

#### **Knowledge**

- Stoke's law of sedimentation
- stability and particle size
- gravitational forces
- inertial impaction
- penetration
- retention
- deposition
- clearance

### **S3.7 Apply the appropriate scientific knowledge relating to other physical principles**

**Knowledge**

- Beer's law and light absorption
- Doppler effect
- Hooke's law, elasticity and compliance

## FOUNDATION SCIENCE

### **S4 Apply knowledge of pharmacological principles**

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- S4.1 Apply the appropriate scientific knowledge relating to the application of medications**
  - S4.2 Apply the appropriate scientific knowledge relating to the pharmacologic response of adrenergic and cholinergic drugs**
  - S4.3 Apply the appropriate scientific knowledge relating to each class of medications**
  - S4.4 Describe the characteristics of specific classes of cardiovascular medications**
  - S4.5 Apply the appropriate scientific knowledge relating to drugs utilized in anaesthesia**
  - S4.6 Apply the appropriate scientific knowledge relating to inhalational anaesthetic agents**
- 

#### **S4.1 Apply the appropriate scientific knowledge relating to the application of medications**

##### **Knowledge**

- basic sources of medications
- classification system of medications: chemical, experimental, generic official and trade
- characteristics of the following formulations: oral, injectable, aerosol, micronized powder, suppository, sublingual transdermal and topical
- advantages and disadvantages of the following routes of administration: enteral, parenteral, topical and inhalational

#### **S4.2 Apply the appropriate scientific knowledge relating to the pharmacologic response of adrenergic and cholinergic drugs**

##### **Knowledge**

- drug classification based on the autonomic nervous system (ANS) divisions
- location and action of adrenergic receptors
- adrenergic and anti-adrenergic drug action
- location and action of cholinergic receptors
- cholinergic and anti-cholinergic drug action

#### **S4.3 Apply the appropriate scientific knowledge relating to each class of medications**

##### **Range (clarification)**

- a. the indications, mechanism of action, routes of administration, side effects

**Knowledge**

- sympathomimetic and para sympathomimetic bronchodilators
- xanthine bronchodilators
- mucolytic agents
- anti-inflammatories
- anti-asthmatic medications
- anti-histamine drugs
- antibiotic, anti-viral and anti-fungal drugs
- diuretics

**S4.4 Describe the characteristics of specific classes of cardiovascular medications****Range (clarification)**

- a. indications, mechanism of action, routes of administration, side effects

**Knowledge**

- cardiotonic agents
- antianginal agents
- diuretic agents
- antiarrhythmic agents
- antihypertensive agents
- antithrombotic and thrombolytic agents

**S4.5 Apply the appropriate scientific knowledge relating to drugs utilized in anaesthesia****Range (clarification)**

- a. indications, mechanism of action, routes of administration, side effects

**Knowledge**

- general principles of intravenous anaesthetic drugs, including their pharmacokinetics
- narcotics and narcotic antagonists
- benzodiazepines, barbiturates and benzodiazepine antagonists
- depolarizing and non-depolarizing muscle relaxants, including their neuromuscular transmission, structure, metabolism and excretion
- cholinesterase inhibitors, including their physical structure and role as reversal agents
- muscarinic antagonists, including their physical structure and their use in conduction with cholinesterase inhibitors
- local anaesthetics

**S4.6 Apply the appropriate scientific knowledge relating to inhalational anaesthetic agents****Range (clarification)**

- a. pharmacokinetics, pharmacodynamics

**Knowledge**

- inhalational anaesthetic agents
- diffusion hypoxia, solubility, second gas effect, compartments of anaesthesia, balanced anaesthesia and interaction with CO<sub>2</sub> absorbents
- characteristics of inhalational anaesthetic agents
- factors which alter the effects of inhaled anaesthetic agents
- effects of inhalational agents on pulmonary ventilation
- effects of inhalational agents on the cardiovascular system

## FOUNDATION SCIENCE

### *S5 Apply knowledge of microbiology*

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**S5.1 Apply the appropriate scientific knowledge relating to the mechanisms of infectious diseases**

**S5.2 Apply the appropriate scientific knowledge relating to agents of infectious diseases**

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#### **S5.1 Apply appropriate scientific knowledge relating to mechanism of infectious diseases**

##### **Knowledge**

- host, infectious disease, colonization, microflora, virulence, pathogen and saprophyte
- concept of host-microorganism interaction
- incidence and prevalence among endemic, epidemic and pandemic
- stages of an infectious disease
- systemic manifestations of infectious disease
- mechanisms and significance of antimicrobial and antiviral drug resistance
- actions of intravenous immunoglobulin and cytokines in treatment of infectious diseases

#### **S5.2 Apply the appropriate scientific knowledge relating to agents of infectious diseases**

##### **Knowledge**

- structural characteristics and mechanisms of reproduction for viruses, bacteria, rickettsia, chlamydia, fungi and parasites
- modes of transmission
- mechanism of infectious diseases using incidence, portal of entry, source of infection, symptomatology, disease source, site of infection, agent and host characteristics

## FOUNDATION SCIENCE

### **S6 Apply knowledge of pulmonary pathophysiology**

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- S6.1 Apply the appropriate scientific knowledge relating to the pathophysiology of diseases and disorders of the pulmonary system**
  - S6.2 Apply appropriate scientific knowledge relating to obstructive processes of the lung**
  - S6.3 Apply the appropriate scientific knowledge relating to obstructive airway disorders**
  - S6.4 Apply the appropriate scientific knowledge relating to the restrictive processes of the respiratory system**
  - S6.5 Apply the appropriate scientific knowledge relating to extra-pulmonary disorders**
  - S6.6 Apply the appropriate scientific knowledge relating to the intra-pulmonary disorders**
- 

#### **S6.1 Apply the appropriate scientific knowledge relating to the pathophysiology of diseases and disorders of the pulmonary system**

##### **Knowledge**

- respiratory (oxygenation) failure in acute and chronic states
- ventilatory (hypercapnic) failure in acute and chronic states

#### **S6.2 Apply appropriate scientific knowledge relating to obstructive processes of the lung**

##### **Knowledge**

- factors that produce obstruction such as: dynamic compression, loss of radial traction (tethering), inflammation, foreign bodies, secretions, hypertrophy and spasm
- factors affecting air flow in the lower airways (i.e. below the glottis): airway lumen size, elastic recoil of the lung, physical properties of the inhaled gas
- the characteristics of airway obstruction, including: change in lung volumes/flows and gas exchange abnormalities
- upper and lower airway obstructions

#### **S6.3 Apply the appropriate scientific knowledge relating to obstructive airway disorders**

##### **Knowledge**

- the following disorders:
  - asthma
  - bronchiectasis

- bronchiolitis
  - bronchogenic neoplasm
  - broncho-pulmonary dysplasia (BPD)
  - choanal atresia
  - chronic obstructive pulmonary disease (COPD) : chronic bronchitis and emphysema
  - croup
  - cystic fibrosis
  - epiglottitis
  - laryngo/tracheo/bronchomalacia
  - foreign body aspiration
  - meconium aspiration syndrome (MAS)
  - obstructive sleep apnea (OSA)
  - Pierre Robin syndrome
  - pulmonary interstitial emphysema (PIE)
  - vascular ring
  - vocal cord dysfunction
- the basic principles of sleep studies and screening
    - the stages of sleep and sleep study screening
    - sleep related disorders
    - the three categories of Sleep Apnea Syndrome (SAS)
    - the signs, symptoms and diagnostic procedures for the evaluation of SAS

#### **S6.4 Apply the appropriate scientific knowledge relating to the restrictive processes of the respiratory system**

##### **Knowledge**

- the restrictive processes of the respiratory system in terms of origin: extra-pulmonary versus intra-pulmonary
- the effects of restrictive processes on pulmonary function:
  - decreased compliance
  - decreased lung volumes
  - diffusion impairment
  - airway re-modeling
  - gas exchange abnormalities
  - pulmonary hypertension

#### **S6.5 Apply the appropriate scientific knowledge relating to extra-pulmonary disorders**

##### **Knowledge**

- broncho-pleural fistula
- pleural effusion

- pneumothorax
- thoracic cage disorders
- traumatic chest wall injuries

## **S6.6 Apply the appropriate scientific knowledge relating to the intra-pulmonary disorders**

### **Knowledge**

- acute respiratory distress syndrome (ARDS)
- atelectasis
- collagen disorders
- diaphragmatic hernia
- hyaline membrane disease / respiratory distress syndrome (RDS)
- hypersensitivity pneumonitis
- pulmonary fibrosis
- inhalation of toxic gases
- neoplasms
- oxygen toxicity
- pharmacological toxicity
- pneumoconiosis
- pneumonia
- pneumonitis
- pulmonary contusion/hemorrhage
- pulmonary edema
- sarcoidosis
- transient tachypnea of the newborn (TTN)

## FOUNDATION SCIENCE

### **S7 Apply knowledge of cardiovascular pathophysiology**

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- S7.1 Apply the appropriate scientific knowledge relating to coronary atherosclerotic heart disease**
  - S7.2 Apply the appropriate scientific knowledge relating to valvular heart disorders**
  - S7.3 Apply the appropriate scientific knowledge relating to inflammatory heart disorders**
  - S7.4 Apply the appropriate scientific knowledge relating to peripheral vascular disorders**
  - S7.5 Apply the appropriate scientific knowledge relating to congenital heart defects**
  - S7.6 Apply the appropriate scientific knowledge relating to types of shock**
  - S7.7 Apply the appropriate scientific knowledge relating to cardiovascular abnormalities**
- 

#### **S7.1 Apply the appropriate scientific knowledge relating to coronary atherosclerotic heart disease**

##### **Knowledge**

- coronary atherosclerotic disease

#### **S7.2 Apply the appropriate scientific knowledge relating to valvular heart disorders**

##### **Knowledge**

- tricuspid stenosis, incompetence, regurgitation
- mitral stenosis, incompetence, regurgitation
- aortic stenosis, incompetence, regurgitation
- pulmonary stenosis, incompetence, regurgitation

#### **S7.3 Apply the appropriate scientific knowledge relating to inflammatory heart disorders**

##### **Knowledge**

- pericarditis
- endocarditis
- myocarditis
- cardiomyopathies: dilated; hypertrophic; restrictive

#### **S7.4 Apply the appropriate scientific knowledge relating to peripheral vascular disorders**

##### **Knowledge**

- arterial
  - arteriosclerosis
  - arterial thrombosis and embolism
  - aneurysm

- aortic dissection
- arterioplasmic disease (Raynaud's)
- pulmonary embolism
- venous
  - thrombophlebitis
  - deep venous thrombosis
  - varicose veins

### **S7.5 Apply the appropriate scientific knowledge relating to congenital heart defects**

#### **Knowledge**

- atrial septal defect
- aortic stenosis
- coarctation of the aorta
- hypoplastic left/right ventricle
- patent ductus arteriosus
- pulmonary stenosis
- right ventricular outflow tract obstruction
- Tetralogy of Fallot
- total anomalous pulmonary venous return
- transposition of the great vessels
- tricuspid atresia
- truncus arteriosus
- ventricular septal defect

### **S7.6 Apply the appropriate scientific knowledge relating to types of shock**

#### **Knowledge**

- anaphylactic
- cardiogenic
- distributive
- hypovolemic
- neurogenic
- septic

### **S7.7 Apply the appropriate scientific knowledge relating to cardiovascular abnormalities**

#### **Knowledge**

- hypertension
- myocardial infarction
- congestive heart failure
- rheumatic heart disease
- dissemination intravascular coagulation

## FOUNDATION SCIENCE

### **S8 Apply knowledge of other diseases and disorders**

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- S8.1 Apply the appropriate scientific knowledge relating to disorders of the central nervous system**
  - S8.2 Apply the appropriate scientific knowledge relating to the disorders of the peripheral nervous system**
  - S8.3 Apply the appropriate scientific knowledge relating to renal failure**
  - S8.4 Apply the appropriate scientific knowledge relating to specific metabolic disorders**
  - S8.5 Apply the appropriate scientific knowledge relating to particular conditions that impair human physiology**
  - S8.6 Apply the appropriate scientific knowledge relating to systemic infections**
- 

#### **S8.1 Apply the appropriate scientific knowledge relating to disorders of the central nervous system**

##### **Knowledge**

- central apnea syndromes
- cerebrovascular accident
- cerebral arterial-venous malformation
- intraventricular hemorrhage
- periventricular leukomalacia
- Reye's syndrome
- space occupying lesions
- sudden infant death syndrome (SIDS)
- thermal instability
- trauma
- brain death

#### **S8.2 Apply the appropriate scientific knowledge relating to the disorders of the peripheral nervous system**

##### **Knowledge**

- amyotrophic lateral sclerosis (ALS)
- diaphragmatic paralysis
- Guillian Barre syndrome
- muscular dystrophy

- myasthenia gravis
- multiple sclerosis
- post-polio syndrome
- spinal muscular atrophy disorders

### **S8.3 Apply the appropriate scientific knowledge relating to renal failure**

#### **Knowledge**

- acute renal failure
- chronic renal failure

### **S8.4 Apply the appropriate scientific knowledge relating to specific metabolic disorders**

#### **Knowledge**

- diabetes
- nephritis

### **S8.5 Apply the appropriate scientific knowledge relating to particular conditions that impair human physiology**

#### **Knowledge**

- inhalation injuries
- electrical and surface burn injuries
- hyperthermia and hypothermia
- drowning and near-drowning
- hypobarism and hyperbarism
- multiple organ dysfunction syndrome (MODS)
- obesity
- hepatitis A & C
- cancers

### **S8.6 Apply the appropriate scientific knowledge relating to systemic infections**

#### **Knowledge**

- influenza (flu)
- H1N1 flu virus
- HIV/AIDS
- pneumonia (pneumococcal)
- poliomyelitis
- tuberculosis
- SARS
- blastomycosis
- ebola
- other current or relevant diseases

## Appendix 1 - Bloom's Trajectory

### Examples of the Use of Bloom's Trajectory - Learning to drive a car

| Stage of Learning  | Knowledge Mastery                | Skills Mastery   |
|--|----------------------------------|--|
| Before you start, you know that you want to learn, and that you have not yet done it all, nor do you know the theory.  | 'conscious incompetence'<br>(K0) | 'conscious incompetence'<br>(S0)                                 |
| Before your first practical lesson you learn the theory, rules and basic sequences, either from a handbook or from the instructor.   | 'remembering' (K1)               | 'readiness' (S1),<br>leading to<br>'understanding'<br>(K2)       |
| Your first practical lesson is driving around a marked track. You very slowly and carefully carry out each move in accordance with the sequence you have learned by heart. You consciously adjust the throttle, depress the brake pedal, etc. Initially you do this when driving in a straight line, then you practise as you negotiate bends. You maneuver for parallel parking and changing lanes. |                                  | 'attempting' (S2)  |
| After sufficient practice you achieve some mastery/fluency and are allowed onto a public road with other traffic. You are encountering new situations and have to think how to respond and then do it. But you still concentrate on every move you make.   | 'applying' (K3)                  | 'basic proficiency'<br>(S3)                                      |
| Considerable and varied practice so that your movements achieve greater mastery / fluency. You no longer have to concentrate to the exclusion of everything else, maneuvering the car is no longer a series of separate actions but has become a single process. You achieve acceptable performance levels.  |                                  | 'expert<br>proficiency' (S4)                                     |
| With further practice your movements become so natural that you no longer think about them consciously.  |                                  | 'unconscious<br>competence'/<br>'adaptable<br>proficiency' (S5). |

There is a similar trajectory for most learning. For some competencies, certain stages appear to be omitted. For example some people have learned their interpersonal skills unconsciously without being taught, without any theory, and so neither 'remembering' (K1) nor 'understanding' (K2). Whereas many others have had to be explicitly taught these skills at college or in the work-place. But with sufficient practice, most will progress to 'adaptable proficiency' (S5)

## Bloom's Trajectory

### Knowledge Domain

|    | Name          | Level descriptors   |
|----|---------------|---|
| K0 | Awareness     | 'Conscious incompetence'  |
| K1 | Remembering   | 'Know what'. Recall data or information; quote rules, definitions, laws   |
| K2 | Understanding | 'Know why'. Understand the meaning, translate, interpolate, and interpret instructions and problems. State a problem in one's own words.  |
| K3 | Applying      | Know how to use a concept in a new situation or unprompted use of an abstraction. Apply what was learned in the classroom into novel situations in the work place. Put a theory into practical effect; demonstrate, solve a problem, manage an activity.  |
| K4 | Analyzing     | Know how to examine information in order to understand, explain or predict. Separate material or concepts into component parts so that its organisational structure may be understood. Distinguish between facts and inferences. Interpret elements, organizational principles, structure, construction, internal relationships. Determine quality, reliability of individual components. |
| K5 | Evaluating    | Know how to weigh up ideas and make a judgement. Make judgments about the value of ideas or materials. Assess effectiveness of whole concepts, in relation to values, outputs, efficacy, and viability. Exercise critical thinking. Conduct strategic comparison and review; make judgements relating to external criteria.   |
| K6 | Creating      | Know how to bring information together in order that something can be decided or acted upon. Build a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure. Create new patterns/concepts, structures, systems, models, approaches, ideas.  |

### Skills Domain (including mental skills as well as physical dexterity)

|    | Level Name            | Level descriptors   |
|----|-----------------------|---|
| S0 | Awareness             | 'Conscious incompetence'  |
| S1 | Readiness             | Know and be ready to act upon a sequence of steps in a process. Recognize one's abilities and limitations (health & safety).  |
| S2 | Attempting            | Imitation: Observe and pattern behaviour after someone else, following instructions and practising. Performance may be of lower quality. Guided Response: Learn a complex skill (early stages) including imitation and trial and error. Adequacy of performance is achieved by practising.  |
| S3 | Basic proficiency     | Learned responses have become habitual and the movements can be performed with some confidence, precision and proficiency. A few minor errors are apparent. Conscious competence.   |
| S4 | Full proficiency      | Skilful performance involves complex patterns. Proficiency is indicated by a quick, accurate, and highly coordinated performance, requiring a minimum of energy. Coordinate and integrate a series of actions, achieving harmony and internal consistency. This category includes performing without hesitation and automatic performance.  |
| S5 | Adaptable proficiency | 'Unconscious competence'. A high level performance becomes natural, without needing to think much about it. Skills are well developed and the individual can modify movement patterns to fit special requirements. Respond effectively to unexpected experiences. For example: Modify instruction to meet the needs of the learners. Use equipment to perform a task it was not originally intended to do (equipment is not damaged and there is no danger in performing the new task). |
| S6 | Creative proficiency  | Create new routines to fit a particular situation or specific problem. Learning outcomes emphasize creativity based upon highly developed skills. Develop new techniques and/or procedures.   |

## Attitudes (and Values) Domain

|    | Level Name | Level descriptors   |
|----|------------|---|
| A0 | Alertness  | Awareness, willingness to hear, selected attention.   |
| A1 | Complying  | Active participation on the part of the learner. Attends and reacts to a particular phenomenon. Attitudes are adopted without consideration or modification, and may be imposed upon the learner by those in authority. Learning outcomes may emphasise compliance in responding, willingness to respond, or satisfaction in responding (motivation). |
| A2 | Valuing    | Attaches values and expresses personal opinions. Decides the worth and relevance of ideas and experiences, but as independent instances, not fully integrated. Accepts/adopts a particular stance or demonstrates attitudes which (while remaining constant), are not consistent with each other.   |
| A3 | Relating   | Considers ethical issues at an abstract, conceptual level. Organizes values into priorities by contrasting different values, resolving conflicts between them, and creating a coherent value system. The emphasis is on comparing, relating, and synthesizing attitudes and values so that they are consistent.                                       |
| A4 | Commitment | Commits to a value system that shapes behaviour. The behaviour is pervasive, consistent, predictable, and most importantly, characteristic of the learner. Learner can act as a role model. Instructional objectives concern the student's general patterns of adjustment (personal, social, emotional).  |