The National Alliance of
Respiratory Therapy Regulatory Bodies

L'Alliance nationale des organismes de
rélementation de la thérapie respiratoire

# NATIONAL COMPETENCY FRAMEWORK

**for the Profession of Respiratory Therapy**

2016 - 2021

## 2016 NCF PART 1

Entry-to-Practice

(including  Evaluation Standards)

# Table of Contents

# Acknowledgements

**The development of this National Competency Framework (NCF) is a result of contributions from many sources. Particularly:**

- The existing Competency Profile and Companion Document

- Related Canadian and international frameworks and sources, particularily CanMEDS

- A precursor project on respiratory therapist (RT) education, with contributions from 24 schools across Canada

- Results from a Trends Survey conducted at the onset of this project

The National Alliance of Respiratory Therapy Regulatory Bodies (NARTRB) acknowledges these substantial contributions, from individuals and organisations, with grateful thanks.

## Steering Committee

| Province | Name | Position |
|---|---|---|
| Alberta (CARTA) | Bryan Buell | Treasurer, NARTRB |
| Saskatchewan (SCRT) | Stephen Chard | Past Treasurer, NARTRB |
| Manitoba (MAART) | Shane McDonald | |
| Ontario (CRTO) | Kevin Taylor | |
| Québec (OPIQ) | Josée Prud'homme | Vice-President, NARTRB; Co-Chair, Registrar Committee |
| New Brunswick (NBART) | Troy Denton | President, NARTRB; Co-Chair, Registrar Committee |
| Novia Scotia (NSCRT) | Shannon McDonald | Past President, NARTRB |
| Newfoundland (NLCRT) | Roger Cook | Secretary, NARTRB |
| National (CSRT) | Christiane Ménard | |

## Anglophone Working Group

| Province | Name | Position |
|---|---|---|
| British Columbia | Lena Farina | Clinical Coordinator Respiratory Services, Providence Health Care |
| Alberta | Amin Thawer<br>Jennifer Oliverio | Diagnostics<br>Neonatal/Paediatrics |
| Saskatchewan | Amy Reid | Adult Critical Care |
| Manitoba | Mark Zarembo<br>Tanis Crosby | Critical Care<br>Critical Care |
| Ontario | Pamela Greco<br>Paul Williams | Critical Care<br>RT Program Coordinator, Fanshaw College |
| New Brunswick | Patrick Dugas | Community Neonatal/Paediatrics |
| Nova Scotia | Donna Young | Community Care (homecare, community hospital and clinic) |
| Newfoundland | Tammy Fagan | Anaesthesia |

## Francophone Working Group

| Province | Name | Position |
|---|---|---|
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| Québec | Annie Denommé<br>Carole Prud'homme<br>Daniel Jorgic<br>Isabelle Roy<br>Jeanne Sénéchal<br>Marc André Lavoie<br>Marie Pier Lévesque<br>Sylvie Rousseau | ICU<br>Manager<br>Acute Care/Emergency ICU<br>Educator<br>Neonatal/Paediatrics<br>Diagnostics<br>Anesthesia<br>Home Care |
| New Brunswick | Daniel Doucette | ICU |

## Interviewees

| Province | Name | Position |
|---|---|---|
| Alberta | Linda Tymchuk | Manager Hospital Accreditation, Alberta Health Services |
| Manitoba | Andrew West | Head of Dept of RT, University of Manitoba |
| Ontario | Sydney Redpath | Academic Chair of Health Sciences, and Board of the Canadian Association of Allied Health Programs |
| Quebec | Julie Laroche | Cégep de Rosemont |
| New Brunswick | Carolyn McCoy<br>Katherine Kowalski | Director Accreditation Services, Canadian Society of Respiratory Therapists<br>Regional Director, Horizon Health Respiratory Services |
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## Participants at National Validation Workshop on May 20, 2015

| Participant Name | | Province | Diagnostics | Critical Care | Neonatal/ Paediatric | Community/ Home Care | Anesthesia | Education | Supervisory | Administration | Research | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Véronique | **Adam** | Québec | | | X | X | | | X | | X | |
| Ginette | **Aubin** | Ontario | X | X | | | | X | | | | X |
| Julie | **Brown** | Ontario | X | X | | | | X | | | X | |
| Rob | **Bryan** | Ontario | | | | | X | | | | | |
| Adam | **Buettner** | Saskatchewan | X | X | | | | | X | | | |
| Cory | **Campbell** | Manitoba | | X | | | | X | | | X | |
| Irina | **Charania** | Alberta | | | X | | | X | | | X | |
| Val Marie | **Coutts** | British Columbia | | | X | | | X | | | | X |
| Brandon | **D'Souza** | Nova Scotia | | X | X | | | | | | | X |
| Kelly | **Dawe** | Newfoundland and Labrador | | | X | X | | | | | | |
| Tom | **Dorval** | British Columbia | | | | | | X | | | | |
| Roberta | **Dubois** | Alberta | X | X | | X | | | X | X | | |
| Susan | **Dunington** | Ontario | | X | | | X | X | | X | | |
| Sheldon | **Fizzard** | Saskatchewan | | | | | | | | | | |
| Martine | **Forest** | Québec | | X | X | | | X | X | | | |
| Tammie | **Fournier** | New Brunswick | X | X | | X | | X | | X | X | |
| Diane | **Gauvreau** | Alberta | | | | | | X | X | X | | |
| Debbie | **Gillis** | Nova Scotia | X | X | X | X | | | X | X | | |
| Karine | **Grondin** | Québec | | X | X | | | X | X | | X | |
| Christine | **Guss** | Alberta | | | X | | | | X | | | |
| Sara | **Han** | Ontario | X | X | | X | | X | | | | X |
| Ingrid | **Hakanson** | British Columbia | | X | | | | | | | | |
| Mark | **Herzog** | Saskatchewan | | | | X | | X | | | | |
| Jim | **Jones** | Nova Scotia | | X | X | | | | | | | |
| Dave | **Jones** | Ontario | | | | X | | | | X | | |
| Candice | **Keddie** | Alberta | X | X | X | X | | X | X | X | X | X |
| Tim | **LePage** | Ontario | | | | | | X | | | | |
| Seana | **Martin** | New Brunswick | | X | X | X | | X | | | | |
| Irene | **Martinez** | Québec | | | **X** | **X** | | X | | | | |
| Carolyn | **McCoy** | Ontario | | | | | | | X | X | | X |
| Elan | **Nattrass** | British Columbia | | | | | | | X | | | |

## Participants at National Validation Workshop on May 20, 2015

| Participant Name | | Province | Diagnostics | Critical Care | Neonatal/ Paediatric | Community/ Home Care | Anesthesia | Education | Supervisory | Administration | Research | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jason | **Nickerson** | Ontario | | | | | X | | | | X | X |
| Bonnie | **O'Leary** | Newfoundland and Labrador | X | X | | | X | | X | | | |
| Élaine | **Paré** | Québec | | | | | | | | | X | X |
| Jennifer | **Piette** | Québec | | | X | | | | | | | |
| Shelley | **Prevost** | Ontario | | | | X | | X | | | X | |
| Pascal | **Rioux** | Québec | | | | | | X | | | | |
| Zubin | **Sologar** | Alberta | | | | | X | | | | | |
| Christina | **Sperling** | Ontario | | X | X | | | | X | X | | |
| Jocelyn | **Vachon** | Québec | | X | | | X | X | | | X | X |
| Danny | **Veniott** | Ontario | | X | | | X | X | X | X | | X |
| Cynthia | **Welton** | Ontario | | X | | | | | | | | X |
| Andrew | **West** | Manitoba | | | | | | X | | | X | |
| Jason | **Zurba** | British Columbia | | X | X | | | X | X | | X | |

## National Validation Survey Respondents

A remarkably high number of RTs from all aspects of this Canadian professional community answered a request to carefully scrutinize the provided competencies, answering detailed questions that took several hours to complete. There were a total of **2,875** responses, which is over **25%** of the **11,216** addressed population of RTs, **1,674** (approximately **58%**) **of the submissions** were complete. Even those who were unable to complete their survey have provided valuable data.

## Project Team

The Alliance has been supported by a project team from CamProf Inc.:

John O'Sullivan
Kathryn Basham
Nigel Lloyd
Don Mayne
Chantal Rioux
Eva Schausberger
Frank Vandenburg

# GLOSSARY

| | |
|---|---|
| Adult | One of the 3 *patient groups* identified in the NCF. *Adults* are those deemed capable of giving informed consent by virtue of their age. In most jurisdictions, this is the age of 18. |
| Areas of Practice | This NCF is intended to apply to all licenced RTs. RTs practice in both the public and private sectors in a wide range of areas of practice, which includes a variety of health care settings and all patient populations: acute care, emergency, intensive care, diagnostics (including sleep studies and pulmonary function), operating rooms, chronic care, community care, primary care, and home care. Some RTs work outside health care environments, in areas such as research, sales, education, and regulation. |
| Attitudes Domain | One of the three domains of *Bloom's Trajectory* (called 'affective' in Bloom's Taxonomy. See Appendix 1.  A learner can progress through 5 levels in the attitudes domain: from alertness through to full commitment. |
| Attitudes (and Values) | The 14 *Attitudes and Values* (A1 to A14) expected of RTs are described at the beginning of the NCF. All practicing RTs are required to adhere to the same set of attitudes and values. The same attitudes are shared by all the competencies and  therefore not repeated for each competency. |
| Bloom's Trajectory | *Bloom's Trajectory* is a modified version of Bloom's Taxonomy. It identifies the different *degrees of mastery* (proficiency) possible for each of the three domains of knowledge, skills and attitudes. See Appendix 1.<br>This classification defines for all the career stages, exactly what level of  proficiency is expected, and is of particular relevance for:<br>1.  teachers, mentors and supervisors - implying what learning experiences will be required to enable the learner to achieve that *degree of mastery*, and<br>2.  assessors - indicating what types of assessment will be appropriate. |
| Career Stage | Four distinct *career stages* have been identified:<br>1.  *Entry to Practice*,<br>2.  *Experienced Professional*,<br>3.  *Senior Professional* and<br>4.  *Expert*.<br>The same competencies are required throughout the career stages; however, the degree of mastery of each element of 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. |
| Clinical Competencies | There are ten *Clinical Competencies* (C1 to C10) which consist of 36 elements. Each describes the scope of practice for the RT. |
| Competency | A *competency* is made up of a number of elements that present a detailed description of the knowledge, skills and attitudes required for an occupation. Competencies are presented in three groups: Core Competencies, Clinical Competencies and Foundation Science competencies. |
| Competency Framework | The *Competency Framework* provides a coherent structure in which the competencies can be presented. It presents a detailed profile of the elements of competency at four significant career stages. |
| Competency-based | The same element of competency will often be required for more than one of the tasks performed by that occupation (for example, many tasks might require the element of competency to communicate in writing). The elements of competency avoid repetition, since they are not task-based. |

| Core Competencies | There are nine *Core Competencies* (B0 to B8) which consist of 41 elements. The core competencies are often shared with other health care professions. The core competencies described in this document are referenced to the Can MEDS Physician Competency Framework. |
|---|---|
| Degree of Mastery | The same competencies are used by an RT at different career stages. However the *degree of mastery* of the elements of competency is typically increasing in complexity as the RT progresses through the various career stages. Bloom's Trajectory is used as the measure of degree of mastery for each element of competency at each career stage. See [Appendix 1](). |
| Element of Competency | Each competency is made up of a number of elements. It is the elements that provide detail to define a specific competency. Each element of a competency has several components: performance criteria, range (clarification) statements, knowledge specification and the degrees of mastery expected at entry to each career stage. |
| Entry to Practice | *Entry to practice* is the initial career stage, at which an RT is registered as licensed to practice. Licensure requires proficiency in all elements of competency as defined in the NCF 2016, with the ability to operate independently and without supervision. |
| Experienced Professional | 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 a higher degree of mastery and an increased 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. |
| Experts | Some RTs become *experts* by developing an expertise in a particular area of the profession. Experts are invited to share their expertise in an area of practice in public and professional forums. They often work with their regulatory bodies and promote the development and improvement of practice standards. They participate in research and sometimes publish textbooks. They develop new strategies, policies or techniques for the profession utilizing their expert clinical knowledge and experience. 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. |
| Foundation Science | There are eight *Foundation Science* competencies (S1 to S8) which consist of 52 elements in the body of scientific knowledge. Each element is required for successful practice as an RT. These primarily knowledge based competencies, are traditionally learned in the classroom setting, or from textbooks, and are assessed by way of written exams. The Foundation Science competencies underpin all of the other skills based competencies (particularly the Clinical Competencies). Because the Foundation Science competencies are knowledge-based, they consist primarily of the Knowledge section; they all share the same generic form, the same performance criteria and the same range statements. |
| Interpret | *Interpret* is to understand the meaning of information. It does not include formal medical diagnosis, which is performed by a licensed medical practitioner. |
| Knowledge | In science-based professions like RT, it is essential to have a grounding in the facts and theories underpinning the practices. There is a separate section of each element of competency that identifies any specific knowledge required for that particular element. In addition, the Foundation Science competencies set out the knowledge required at entry to practice. |

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| Knowledge Domain | Knowledge is one of the three domains of Bloom's Trajectory (called 'cognitive' by Bloom's Taxonomy. A learner can progress through seven degrees of mastery in the knowledge domain, from awareness through to creating. |
| Neonatal | One of the 3 patient groups identified in the NCF. Neonates are those patients from birth to 28 days of age, corrected for premature birth. Neonates require a variety of special considerations such as those relating to their physical size and development, legal status, inability to communicate and make decisions. In some clinical competencies there are different degrees of mastery required for each patient group at the entry to practice career stage for the skills domain, reflecting the fact that students are unlikely to gain a vast amount of clinical experience with neonates. |
| Pediatric | One of the 3 patient groups identified in the NCF. Pediatric patients are those intermediate between neonates and adults, requiring a variety of special considerations such as those relating to their physical size and development, legal status, ability to communicate and make decisions. In some clinical competencies there are different degrees of mastery required for each patient group at the entry to practice career stage for the skills domain, reflecting the fact that students are less likely to gain a vast amount of clinical experience with pediatric patients. |
| Patient Groups | The NCF distinguishes three principal patient groups: neonatal, pediatric, and adult. |
| Patient-centred | The NCF has been consciously prepared to be patient-centred: putting the patient at the centre of the competency framework. When specifying the competencies, the Working Groups and reviewers have been asked "are there any other aspects that should be included from the patient's viewpoint?" The NCF is intended to lead the fundamental paradigm shift towards patient-centred health care. |
| Performance Criterion / Criteria | Statements providing additional details regarding the required level of performance (to be deemed a competent RT). *Performance Criteria* (often abbreviated to PCs) therefore indicate the knowledge and skills that need to be learned, demonstrated and assessed. Competence requires all *performance criteria* to be satisfied. |
| Primary care | *Primary care* aims to assure better health for all by: 1. reducing exclusion and social disparities in health (universal coverage) 2. organizing health services around people's needs and expectations (service delivery reforms) 3. integrating health into all sectors (public policy reforms) 4. pursuing collaborative models of policy dialogue (leadership reforms) and 5. increasing stakeholder participation |
| Progression Path | RTs at all career stages have achieved their current set of competencies by a combination of formal and informal learning and experience. Every RT has had a unique learning path reflecting their different opportunities, learning preferences and other circumstances. The NCF distinguishes four significant career stages. All registered RTs start at Entry to Practice and can be expected to become Experienced Professionals after several years of RT practice. After that, further progression is much more individual and varied. Most RTs remain practicing the competencies, some develop additional competencies to become a team leader and Senior Professional, while others use research and further study to become an Expert in a particular area. |
| Range (clarification) | Range statements specify the variety of circumstances or scope that an element of competency is intended to cover. They provide a clarification of the wording used in the competency statement and its performance criteria as well as the context in which the competency takes place. Due to jurisdictional differences in scope of practice, for some competencies (e.g. C5, C10) the range identifies which competencies RTs in one jurisdiction may perform, while RTs in other jurisdictions are limited to assisting other members of the health care team with a particular competency. |

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| RT | RT has been used throughout the NCF as the abbreviation for both Respiratory Therapy and Respiratory Therapist. RTs has been used as the abbreviation for Respiratory Therapists. |
| 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. |
| Skill | A professional must be able to practice competently and safely; this is the whole reason for professional regulation. It is not enough for a professional to know all the facts and theories underpinning the practices, they must also be able to perform them to an acceptable degree of mastery. Skills are not only the physical actions and dexterity, but also the mental skills to perform the procedures and the underlying competencies. In general, the Foundation Science competencies concentrate on the knowledge and a limited set of generalized physical and mental skills required at entry to practice. The entry to practice skills will mostly be learned through simulation and clinical practicum placements. |
| Skills Domain | Skill is one of the three domains of Bloom's Trajectory (called 'psychomotor' by Bloom's Taxonomy. A learner can progress through seven levels in the skills domain, from A0 (awareness) through to A6 (creative proficiency), which is demonstrated by developing new techniques. |

# INTRODUCTION TO THE FRAMEWORK

# Introduction

**This National Competency Framework (NCF) contains a number of new components:**

- the list of the attitudes and values expected of all respiratory therapists (RTs)--these are also reflected in the statements of competency;

- guidelines on the expectations at key stages of the RT's career, (not just at registration or entry to practice) – outlined in Part II;

- 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 takes a patient-centred approach.

There are many stakeholders who will use the NCF, for a variety of purposes. It is a practical tool for use by educators and accreditation bodies for the design and maintenance of educational programs. It is used by regulators and examiners to build entry to practice assessment tools and continuing quality assurance programs. Professional RTs use the NCF throughout their career as they plan and review their professional development. Employers and managers rely on the NCF for performance appraisal, continuing education, promotion and recruitment. In addition, the public, other health care professionals, governments, Fairness Commissioners, equipment manufacturers, foreign trained professionals and other stakeholders may use the NCF to obtain guidance regarding the practice and competencies of RTs.

The intent is that the NCF be a 'living document' that will continue to evolve along with the profession, environment and technology. Over time, the NCF will be updated, relying on consultation with the profession.

**Changes are welcomed and may result from:**

- correction of errors;

- feedback from stakeholders;

- technical, organisational and regulatory change in the profession; and

- the recognition of new uses for the NCF.

We have based our structure on the CanMEDS Physician Competency Framework, used by the Royal College of Physicians and Surgeons since 1996, in order to maximize inter-operability. The CanMEDS Framework describes the *knowledge*, *skills* and *attitudes* that specialist physicians need, based on seven roles: Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar, and Professional. The NCF adds an additional role (B5 Critical thinking and reasoning skills), transforms Manager into B8 Accountability (appropriate to role in the health care team), and drops Scholar.

# Uses of the National Competency Framework

This National Competency Framework (NCF) serves as the pan-Canadian reference on respiratory therapy competencies for practitioners, educators, employers, regulators, exam and accreditation agencies, and other stakeholders. The NCF summarizes the competencies relevant to RTs for entry to practice (Part I) and throughout their career (Part II). It identifies four career stages and supports career planning, development and progression.

## New Entrants to the Profession (Part I)

The NCF clearly outlines the entry to practice requirements, to guide students in their personal learning journey and assist them in preparing for their licensing examinations.

## Early Career Practitioners (Part II)

The NCF describes the competencies for Experienced Professionals and identifies the level of proficiency that distinguishes an experienced practitioner from a new entrant. This supports career development and recognition for early- to mid-career professionals.

## Senior Professionals (Part II)

The NCF identifies a specific set of leadership and management competencies and supports career development and recognition of Senior Professionals of respiratory care teams.

## Experts (Part II)

The NCF describes the competencies of an Expert in RT and identifies the level of proficiency that distinguishes an Expert from an Experienced Professional. This supports career development and recognition for mid- to late-career professionals.

## Educators

The NCF sets out the pan-Canadian competencies required of new entrants to the profession. It serves as a reference for program coordinators, teaching staff and clinical educators to guide curriculum planning, teaching and assessment.

## Employers

The NCF outlines practice requirements throughout an RT's career. This supports employers in hiring, career development, performance management and succession planning activities.

## Program Accreditation Agency

Attainment of all entry-to-practice requirements is a critical requirement for RT education programs. The NCF outlines the pan-Canadian competencies required for new entrants to the profession.

## Certification Exam Agency

The certification exam agency is responsible for developing a national credentialing exam that reflects the requirements for entry-to-practice. The NCF clearly outlines the entry-to-practice requirements and is the basis for the national credentialing exam.

### Professional Associations

The NCF describes the competencies relevant to RTs throughout each stage of their career. As such, it serves as a reference for professional associations as they support and advocate for RTs. The NCF describes competencies for each career stage to support professional development initiatives.

### Regulators

The NCF clearly outlines entry-to-practice requirements. It serves as a reference for regulators in stewarding the profession and protecting the public.

### Other Stakeholders

The NCF outlines what is expected of RTs. It serves as a reference for patients, families, related health professionals, health care providers and the general public.

## Career Stages

### Entry to Practice (NCF Part I)

Entry to practice is the initial career stage, at which an RT is registered as licensed to practice. Licensure requires proficiency in all elements of competency as defined in the NCF 2016, with the ability to function independently without supervision.

### Experienced Professional (NCF Part II)

The Experienced Professional career stage requires a fluency of operation beyond entry to practice. Experienced Professionals can perform everything the new entrant can, but with a higher degree of mastery and with an increased 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 (NCF Part II)

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 progresses 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 (NCF Part II)

Some RTs become Experts by developing an expertise in one area of the profession such as pediatrics. Experts are invited to share their expertise in an area of practice in public and professional forums. 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 typically 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:

## Competency Statement

Each competency is defined using a short action statement describing what an RT must be able to perform to be considered competent at an entry-to-practice level. The verb used provides guidance as to 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 (necessary to be deemed proficient ) 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 performance criteria identified 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.

## How to Interpret and Apply the Evaluation Standards

All the competencies described in this document are required for Entry to Practice. Yet, when comparing the skill level, frequency of performance and harm ratings for the various competencies there are clearly differences between them. Although all competencies are required for ETP some are clearly more important, or critical, than others.

Competency evaluation utilizes multiple points of evaluation during an academic program and multiple methods and environments are used to evaluate competency. Competencies with the highest importance/criticality should be evaluated at multiple points in multiple environments (i.e., didactic, OSCE/Simulation, clinical setting).

A standard methodology for the determination of importance or criticality of competencies does not currently exist in the literature. In this case, the criticality was determined using a methodology that utilized the data obtained during the development of the NCF, data which includes the ratings for skill, frequency and harm.  Four (4) separate criteria were applied:

**Criteria 1:** Competencies that have a lower skill level (<3)

**Criteria 2:** Competencies with high harm, low frequency (harm >3, frequency <3)

**Criteria 3:** Competencies with low harm, low frequency (harm<3, frequency <3)

**Criteria 4:** Other considerations not identified by criteria

Additionally, the criteria of public interest, safety and reasonableness were applied when considering the minimum level required for evaluation of each competency.

### The Role of Simulation in the Evaluation of Competency

The NARTRB referred to the February 2016 report from the Clinical Simulation Advisory Workgroup for recommendations on the "Appropriate Utilization of Clinical Simulation: Informing Implementation of the National Competency Profile".

Assessment is a continuum of both formative and summative assessment and the assessment of learning, and therefore competency attainment, should be conducted at numerous points in the educational process.

Summative Assessment in the clinical environment remains the gold standard. Yet, summative assessment in the simulated environment may be acceptable under exceptional circumstances:

• Limitations in clinical exposure
• IEHP  or re entry assessment
• If simulation can offer a higher quality of assessment than is available clinically

Limitations to consider when using simulation for summative assessment include:

• Whether individuals conducting the assessment have the knowledge, skills, attitudes and abilities to appropriately conduct assessment within the simulated environment

• Adequacy of resources

• Recognizing that simulation is an approximation of reality

• Single point assessments may not be effective to adequately determine the attainment of competency

## Applying the Evaluation Standards

The Evaluation Standards listed indicate the minimum level(s) at which each competency must be evaluated. Evaluation in the clinical environment, however, still remains the "gold standard". Evaluation at additional levels is encouraged (i.e., a competency evaluated via simulation can still be evaluated additionally in a clinical setting wherever possible).

## Structure of the Framework

The NCF competencies are divided into:

- Ten Clinical Competencies (C1 to C10),
- Supported by nine Core Competencies (B0 to B8), and
- Underpinned by eight Foundation Science Competencies (S1 to S8).
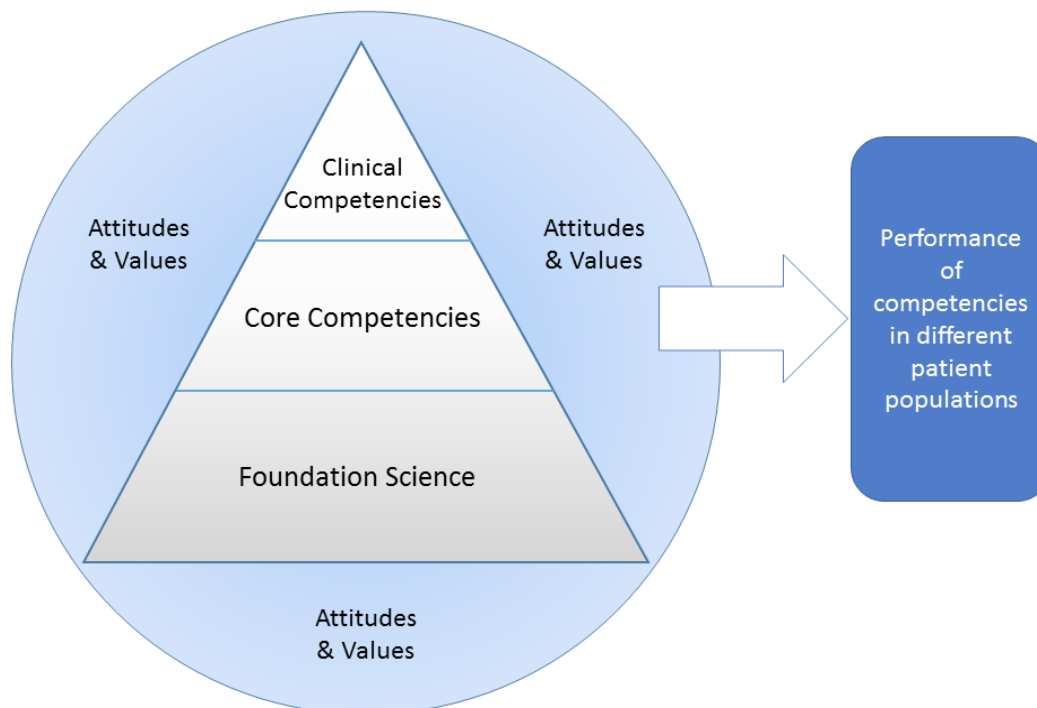
Each Competency contains several elements.

The degree of mastery for Core Competencies and Clinical Competencies is defined for:

- Knowledge
- Skills
- Attitudes & Values

and at four career stages:

- Entry to practice (outlined in Part I)
- Experienced Professional (outlined in Part II)
- Senior Professional (outlined in Part II)
- Expert (outlined in Part II)

| Patient Population | P1 | Neonatal |
| | P2 | Paediatric |
| | P3 | Adult |
| **Attitudes and Values** | A1 | Duty to patients |
| | A2 | Duty to others |
| | A3 | Perform within competence |
| | A4 | Confidentiality |
| | A5 | Participate in continuous professional development |
| | A6 | Independence and impartiality |
| | A7 | Honesty and integrity |
| | A8 | Supervision of others |
| | A9 | Comply with codes of conduct and practice |
| | A10 | Professional liability insurance |
| | A11 | Conflicts with moral or religious beliefs |
| | A12 | Environment and sustainability |
| | A13 | Obligation to report unsafe or inappropriate practices |
| | A14 | Behaviour |
| **Core Competencies** | B0 | Provide evidence-informed, patient-centred, respiratory care |
| | B1 | Demonstrate professional behaviour |
| | B2 | Communicate effectively |
| | B3 | Collaborate in the interdisciplinary health care team |
| | B4 | Optimize cardio-respiratory health and wellness of the community |
| | B5 | Demonstrate critical thinking and reasoning skills |
| | B6 | Perform administrative duties |
| | B7 | Implement preventive measures to ensure health and safety |
| | B8 | Demonstrate accountability appropriate to role in the health care team |
| **Clinical Competencies** | C1 | Assess patient's cardio respiratory status |
| | C2 | Optimize patient safety |
| | C3 | Administer medication and substances |
| | C4 | Manage airway |
| | C5 | Perform anaesthesia assistance |
| | C6 | Provide optimal ventilation assistance |
| | C7 | Execute resuscitation |
| | C8 | Administer cardio-pulmonary diagnostic tests |
| | C9 | Perform adjunct therapies |
| | C10 | Perform invasive vascular procedures |
| **Foundation Science** | S1 | Apply knowledge of anatomy and physiology |
| | S2 | Apply knowledge of chemistry and biochemistry |
| | S3 | Apply knowledge of physics |
| | S4 | Apply knowledge of pharmacological principles |
| | S5 | Apply knowledge of microbiology |
| | S6 | Apply knowledge of pulmonary pathophysiology |
| | S7 | Apply knowledge of cardiovascular pathophysiology |
| | S8 | Apply knowledge of other diseases and disorders |

The degree of mastery at entry to practice is separately specified for each of the three patient groups 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 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

RTs have a duty to their health care colleagues, employers, regulatory authorities, and the 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 duties within their own level of competence and respect the level of 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 reltionships 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 Standards of 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

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.*

## 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)

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K5 | S4 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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

**Range (clarification)**

a.    examples may include: standards of practice, clinical practice guidelines, protocol, policies and literature reviews

**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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

# Core Competency

## B1: Demonstrate professional behaviour

**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.*

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S4 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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, interprofessional, 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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A3 |
| **Evaluation Standard** | Clinical | | |

## 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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K5 | S4 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A3 |
| **Evaluation Standard** | Clinical | | |

## 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)**

a.   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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Didactic | | |

## 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)**

a.     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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Didactic | | |

# Core Competency

## B2   Communicate effectively

**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.*

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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)**

a.     communicate with patients, their families, members of the health care team, the general public

b.     documentation: written, recorded or drawn and stored on paper, digitally or a recording device

c.     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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S4 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Simulation | | |

# Core Competency

## B3   Collaborate in the interprofessional health care team

**B3.1**      Collaborate in professional consultation in an interprofessional 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.*

## B3.1   Collaborate in professional consultation in an interprofessional 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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

**Range (clarification)**

a.    examples may include: case study presentations, research projects

**Knowledge**

•    research methods

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Didactic | | |

# Core Competency

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

**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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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 may include: telemedicine, pulmonary rehab, smoking cessation, sleep hygiene

**Knowledge**

•    purpose, strategies, and goals of community health programs

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Simulation | | |

**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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S4 | A3 |
| **Evaluation Standard** | Clinical | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A3 |
| **Evaluation Standard** | Clinical | | |

## 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

B5.3.5  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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A3 |
| **Evaluation Standard** | Clinical | | |

# 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)

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K2 | S3 | A1 |
| **Evaluation Standard** | Didactic | | |

## 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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Didactic | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K2 | S1 | A2 |
| **Evaluation Standard** | Didactic | | |

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

**Performance criteria**

B6.5.1    Assess the health care working environment

**Range (clarification)**

a.    examples may include: environment, risk management, resources, demographic data, personnel

b.    assessments may include: workplace health and safety, risk management, incident / accident reporting

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | n/a | n/a | n/a |
| **Evaluation Standard** | Simulation | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A3 |
| **Evaluation Standard** | Didactic | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Didactic | | |

# Core Competency

## B7   Implement preventive measures to ensure health and safety

| | |
|---|---|
| **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 |

**Range (clarification)**

a.   examples may include: patient, patient care providers, family members, visitors

**Knowledge**

•   Understanding of measures to mitigate risk

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## B7.3   Manage biohazardous materials

**Performance criteria**

B7.3.1     Handle and safely dispose biohazardous materials

**Knowledge**

- common types of biohazardous materials

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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S4 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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 Workplace Hazardous Materials Information System (WHMIS 2015) and Occupational Safety Health and Wellness
- initial procedure for injuries occurring in the workplace

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S4 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S4 | A2 |
| **Evaluation Standard** | Didactic | | |

## 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
• Transport Canada regulations and procedures for handling and storing medical gases/liquids

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S4 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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**

• institutional codes
• the role of the RT

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Didactic | | |

## 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

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S3 | S3 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | |
| | Paeds | Clinical | | |
| | Neo | Clinical | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A2 |
| **Evaluation Standard** | Clinical | | |

## 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, interprofessional team, colleagues, employer

**Knowledge**

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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K4 | S3 | A2 |
| **Evaluation Standard** | Didactic | | |

# Core Competency

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

**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.*

## 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 | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K2 | S2 | A2 |
| Evaluation Standard | Didactic | | |

## 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:  examples may include: change of practice, change of protocols, change of organizational culture

**Knowledge**

- change management principles, techniques, drivers and obstacles
- organizational and professional values

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K2 | S2 | A2 |
| **Evaluation Standard** | Didactic | | |

## 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

| Career Stage | Entry to Practice | | |
|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skill | Attitude |
| | K3 | S3 | A3 |
| **Evaluation Standard** | Simulation | | |

# CLINICAL COMPETENCIES

# Clinical Competency

## C1   Assess patient's cardio respiratory status

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

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

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

## 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 - examples may include: transcutaneous O2 and CO2, end-tidal CO2, pulse oximetry, ventilatory parameters, blood pressure

b.   invasive monitoring – examples may include: hemodynamics, ventilatory parameters

c.   comprehensive patient history – examples may include: patient charts, co-morbidities, patient and family interview, shift reports

d.   relevant diagnostic results - examples may include: 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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |

## C1.2  Analyze the collected information

**Performance Criteria**

C1.2.1    Compare obtained information with normal values

**Knowledge**

• normal values

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |

## 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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |

# Clinical Competency

## C2   Optimize Patient Safety

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

**C2.2**      **Manage patient safety risks**

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

## 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 | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |

## 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 | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | |
| | Paeds | Clinical | | |
| | Neo | Clinical | | |

## 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

C2.3.3    Take part in timely event analysis, reflective practice and planning to prevent recurrence

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S3 | S3 | S3 | A3 |
| **Evaluation Standard** | Adult | Simulation | | |
| | Paeds | Simulation | | |
| | Neo | Simulation | | |

# Clinical Competency

## C3   Administer medication and substances

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 and substance administration

## 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.    examples may include: bronchodilators, benzodiazepines, narcotics, prostacyclins, antibiotics

b.    substance - examples may include: blood, plasma crystalloid substance

c.    protocol -  includes algorithm and pathway

d.    routes of enteral and parenteral administration- examples may include: 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

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | |
| | Paeds | Clinical | | |
| | Neo | Clinical | | |

## C3.2 Prepare medications and substances for administration

**Performance Criteria**

C3.2.1 Perform dosage calculations

C3.2.2 Safely prepare medication 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)**

a. administration of: substances by inhalation, instillation, orally, topical, transdermal, injection and infusion

b. monograph: information provided by the drug manufacturer to the health care team

c. Workplace Hazardous Materials Information System 2015, (WHMIS 2015)

**Knowledge**

• dosages and concentrations of medications and substances

• independent double check

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |

## 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)**

a.  administration of: substances by inhalation, instillation, orally, transdermal, injection, infusion

b.  includes administration of medical gases and surfactants

c.  medical gases do not apply to inhaled anaesthetic agents, because these are covered under the Anaesthesia Competency

d.  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)

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |

## 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)**

a.  protocol: includes algorithm and pathway

**Knowledge**

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S4 | S4 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |

# 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 (not applicable to neonate)


**Range (clarification)**

a.    examples may include: 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 airways device

- situations and corrective actions related to difficult airway situations

- tracheostomy procedure

- technique for tracheostomy care

- procedures for tracheotomy weaning and corking

- procedures for laryngectomy and laryngectomy weaning

- methods used to allow patients with a tracheotomy to communicate

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| **C.4.1.1 - C4.1.7, C4.1.9** | K4 | S3 | S3 | S4 | A3 |
| **C4.1.8** | K2 | S2 | | | A2 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Simulation | | | |
| | Neo | Simulation | | | |

## 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 (not applicable to neonate)

**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

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S2 | S3 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Simulation | | | |
| | Neo | Simulation | | | |

# Clinical Competency

## C5   Perform anaesthesia assistance

**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 (examples may include: 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 | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | S2 | S2 | S3 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Simulation | | | |
| | Neo | Simulation | | | |

## 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)**

a.    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 | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | S2 | S3 | S3 | A3 |
| **Evaluation Standard** | Adult | Simulation | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

## 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 during sedation or perform analgesic sedation

**Range (clarification)**

a.   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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S2 | S2 | S3 | A3 |
| **Evaluation Standard** | Adult | Simulation | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

# Clinical Competency

## C6   Provide optimal ventilation assistance

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

**C6.2**      **Provide optimal 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 – examples may include:  self-inflating, flow-inflating, T-piece resuscitator

b.    manual ventilation -  examples may include:  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

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | S3 | S3 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | |
| | Paeds | Clinical | | |
| | Neo | Clinical | | |

## 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) C6.2.1 - C6.2.4**

a.    applies to non-invasive mechanical ventilation (NIPPV), invasive mechanical ventilation

b.    applies to all patient groups

c.    conventional modes of ventilation - examples include:  volume-control ventilation (VCV), 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 – examples include:  auto-peep, air trapping, lower and upper inflection points, auto triggering, patient triggering, plateau pressure, static and dynamic compliance, resistance, expiratory pause, occlusion pressure

**Range (clarification) C6.2.5**

a.    examples include: 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 | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| **C6.2.1 - C6.2.4** | K5 | S3 | S3 | S4 | A3 |
| **C6.2.5** | K2 | S1 | | | A2 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Simulation | | | |
| | Neo | Simulation | | | |

## 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- examples may include: breath stacking

- pneumatic techniques – examples may include: IPPB, positive expiratory pressure

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | n/a | S3 | S3 | A2 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Didactic | | | |
| | Neo | n/a | | | |

# 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. Students are expected to possess the knowledge and skill in order to perform BLS, ACLS, PALS, and NRP protocols according to current standards within the simulated environment.  Certification by the program is not required.\**

*\*Clinical sites in some jurisdictions may require some or all certifications prior to student clinical placements.*

## 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

b.   "distinction" refers to comparing and contrasting resuscitation guidelines including indications for their use.

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | S4 | S4 | S4 | A2 |
| **Evaluation Standard** | Adult | Didactic | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

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

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | S4 | S4 | S4 | A2 |
| **Evaluation Standard** | Adult | Simulation | | | |
| | Paeds | Simulation | | | |
| | Neo | n/a | | | |

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | n/a | n/a | S3 | A2 |
| **Evaluation Standard** | Adult | Simulation | | | |
| | Paeds | n/a | | | |
| | Neo | n/a | | | |

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | n/a | S3 | n/a | A2 |
| **Evaluation Standard** | Adult | n/a | | | |
| | Paeds | Simulation | | | |
| | Neo | n/a | | | |

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S3 | n/a | n/a | A2 |
| **Evaluation Standard** | Adult | n/a | | | |
| | Paeds | n/a | | | |
| | Neo | Simulation | | | |

# Clinical Competency

## C8   Administer cardio-pulmonary diagnostic tests

**C8.1**      Perform and interpret electrocardiograms

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

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

## C8.1   Perform and interpret electrocardiograms

**Performance Criteria**

C8.1.1    Perform an electrocardiogram

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

C8.1.3    Interpret results

**Range (clarification)**

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

**Knowledge**

•     see S7: cardiovascular pathophysiology

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K5 | S3 | S3 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

## C8.2 Perform and interpret pulmonary function testing

**Performance Criteria**

C8.2.1    Perform pulmonary function testing

C8.2.2    Assess the validity and quality of the results

C8.2.3    Interpret the results

**Range (clarification)**

a.    examples may include: lung volume testing flow transducer, impulse oscillation system

**Knowledge**

- See S6: pulmonary pathophysiology

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | n/a | S3 | S4 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Didactic | | | |
| | Neo | n/a | | | |

## 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.    multichannel (level 3 and level 4 testing based on the Canadian Thoracic Society Guidelines) performed with portable monitoring) – examples may include: overnight oximetry , portable monitoring

> *Note: this competency does not include polysomnography as additional certification is required*

**Knowledge**

- See S6: pulmonary pathophysiology

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K3 | S2 | S3 | S3 | A2 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

# 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

**Knowledge**

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K2 | S2 | S2 | S3 | A2 |
| **Evaluation Standard** | Adult | Simulation | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

## 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 | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | n/a | S3 | S3 | A2 |
| **Evaluation Standard** | Adult | Simulation | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

## 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 other than anesthesia

**Knowledge**

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S3 | S3 | S3 | A2 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Clinical | | | |
| | Neo | Clinical | | | |

## 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.   examples may include: ventilated, non-ventilated, internal, external

**Knowledge**

• necessary precautions and contingency plans required when transporting a patient

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S3 | S3 | S3 | A3 |
| **Evaluation Standard** | Adult | Clinical | | |
| | Paeds | Simulation | | |
| | Neo | Simulation | | |

# 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.   examples may include: intravenous, intra-osseous, umbilical venous catheter

**Knowledge**

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K3 | S1 | S1 | S3 | A2 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

## 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

**Range (clarification)**

a.    includes umbilical artery lines

**Knowledge**

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
|  |  | Neo | Paed | Adult |  |
|  | K4 | n/a | S2 | S4 | A2 |
| **Evaluation Standard** | Adult | Simulation | | | |
|  | Paeds | Didactic | | | |
|  | Neo | Didactic | | | |

## 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

**Range (clarification)**

a.    arterial puncture – required

a.    venous and capillary puncture – optional

a.    according to provincial and territorial scope of practice, "perform the procedure" may mean "to assist with" in some jurisdictions

**Knowledge**

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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | S2 | S2 | S3 | A3 |
| **Evaluation Standard** | Adult | Clinical | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

## 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

| Career Stage | Entry to Practice | | | | |
|---|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | | Attitude |
| | | Neo | Paed | Adult | |
| | K4 | n/a | S2 | S3 | A2 |
| **Evaluation Standard** | Adult | Simulation | | | |
| | Paeds | Didactic | | | |
| | Neo | Didactic | | | |

## 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 (clarification)**

a.    examples may include: indwelling catheter: arterial, pulmonary artery, central venous, 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

| Career Stage | Entry to Practice | | | |
|---|---|---|---|---|
| **Degree of Mastery** | Knowledge | Skills | | Attitude |
| | | Neo | Paed | Adult | |
| | K3 | S2 | S2 | S3 | A2 |
| **Evaluation Standard** | Adult | Simulation | | |
| | Paeds | Didactic | | |
| | Neo | Didactic | | |

# 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 reflect 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

**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

## 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

**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
- ressure: 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

**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 $CO_2$ 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

**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

## 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

**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:
    - o  asthma
    - o  bronchiectasis
    - o  bronchiolitis
    - o  bronchogenic neoplasm
    - o  broncho-pulmonary dysplasia (BPD)

- o choanal atresia
- o chronic obstructive pulmonary disease (COPD) : chronic bronchitis and emphysema
- o croup
- o cystic fibrosis
- o epiglottitis
- o laryngo/tracheo/bronchomalacia
- o foreign body aspiration
- o meconium aspiration syndrome (MAS)
- o obstructive sleep apnea (OSA)
- o Pierre Robin syndrome
- o pulmonary interstitial emphysema (PIE)
- o vascular ring
- o vocal cord dysfunction
- the basic principles of sleep studies and screening
  - o the stages of sleep and sleep study screening
  - o sleep related disorders
  - o the three categories of Sleep Apnea Syndrome (SAS)
  - o 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:
  - o decreased compliance
  - o decreased lung volumes
  - o diffusion impairment
  - o airway re-modeling
  - o gas exchange abnormalities
  - o 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

**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
  - o  arteriosclerosis
  - o  arterial thrombosis and embolism
  - o  aneurysm
  - o  aortic dissection
  - o  arterioplastic disease (Raynaud's)
  - o  pulmonary embolism
- venous
  - o  thrombophlebitis
  - o  deep venous thrombosis
  - o  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

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' (K0) | 'conscious incompetence' (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), leading to 'understanding' (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 practice 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' (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 proficiency' (S4) |
| With further practice your movements become so natural that you no longer think about them consciously. | | 'unconscious competence'/ 'adaptable 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 | Skills Mastery |
|---|---|---|
| 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. |

# Bloom's Trajectory

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

|  | Level Name | Level descriptors |
|---|---|---|
| S0 | Awareness | 'Conscious incompetence' |
| S1 | Readiness | 'Know what'. Recall data or information; quote rules, definitions, laws |
| S2 | Attempting | 'Know why'. Understand the meaning, translate, interpolate, and interpret instructions and problems. State a problem in one's own words. |
| S3 | Basic proficiency | 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. |
| S4 | Full proficiency | 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. |
| S5 | Adaptable proficiency | 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. |
| S6 | Creative proficiency | 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. |

## 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). |