



Respiratory Physiotherapy Task Force

Recommendations for a core curriculum in respiratory physiotherapy for adult patients

The European Respiratory Society (ERS) Respiratory Physiotherapy task force has previously developed a syllabus, describing a core set of knowledge, skills and attitudes that physiotherapists require in order to assess, treat and follow patients with respiratory disorders. A detailed overview of this syllabus and its methodology is available elsewhere (Pitta et al., 2014). From the syllabus, the core team have now built a curriculum, which provides insight in the content and the format of the educational content (skills and knowledge any respiratory physiotherapist should possess). The curriculum focuses on *how these aspects will be taught*. The curriculum is divided into nine modules, out of which seven are mandatory and two are considered optional. For each module, the *competencies* required of the trainee have been outlined considering the knowledge, skills and attitudes prescribed within the module and expected of the trainee on entry into practice. The CanMEDS 2015 Framework was used as a reference for a competency-based medical education model. For each module the corresponding CanMEDS roles a physiotherapist should be able to acquire/perform after following a certain module were specified.

Pre-requisites for entering into the specialty: Trainees must have fully completed their physiotherapy education and are nationally recognised and licenced to practice.

For those entering into specialty training in respiratory physiotherapy, it is recommended that a certain number of clinical experience should be present.

Target Audience: All certified physiotherapists working within respiratory physiotherapy areas of practice are eligible to enter training.

Minimum duration of training: It is recommended a period of minimum one year of work (full time employment) within a respiratory area of practice (depending on local differences such as availability of specific centres/ general hospital with respiratory ward). It should be allowed the possibility of completing the programme part time within a maximum of 3 years. The length of training may be reviewed by an appeals committee in exceptional circumstances.

The curriculum includes the following elements:

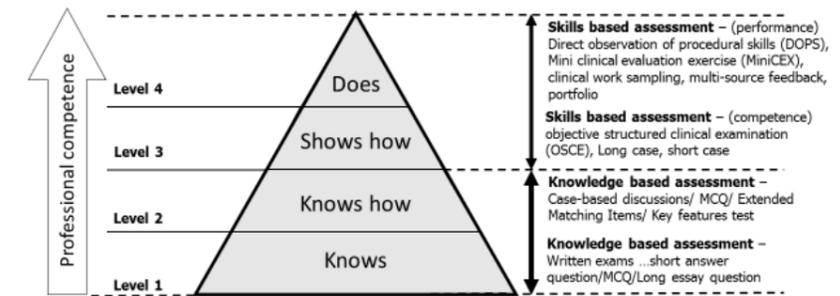
The **learning outcomes** (knowledge, skills and attitudes) a respiratory physiotherapist should possess. These will guide the trainee and trainer to achieve competencies.

The **teaching and learning opportunities** used to teach the learning outcomes. These prescribe a teaching method appropriate to the competency or may include a sample clinical situation. This may include informal and/or formal learning opportunities suitable for postgraduate/post specialty learning environments.

The best **teaching methods and assessments** used. These include the methods which are applicable across all training centre networks irrespective of geographical location. Assessments are linked to the learning outcomes and the level of competence required.

The appropriate **assessment level** used to evaluate the desired learning outcomes. This is based upon Miller's model of clinical competence). Selection of appropriate assessment methods fit for purpose are essential to the validity of assessments and to predict whether a trainee is competent to practice. The level of assessment has been assigned in alignment with the learning outcomes (knowledge, skills and attitudes), assessment methods chosen and teaching and learning opportunities.

Millers Model of clinical competence



Adapted figure from Miller's model of clinical competence, and organisation of assessment methods reproduced from Amin et al. (2006)¹, with permission from the publisher.

The **minimum clinical and educational exposure** (such as number of patients/procedures) considered necessary for a respiratory physiotherapist to practice on its own. These are defined globally per curriculum track in terms of a total number of patients. In addition, the specific procedures that should be mastered in each module to be identified specifically. A certain number of cases to be mentioned as necessary to be performed both independently and under supervision. To assess this in terms of percentages of learning outcomes and by providing the evidence attesting that it was performed in clinical exposure. For instance, a minimum of 50 patients is considered sufficient to cover at least 80% of the procedures listed across all modules. The patients can come from different settings such as: hospital based, ambulatory or community care. The procedures should be performed a certain number of times (determined per module). At the same time, we recommend using (whenever it is possible) the same patients for performing the different procedures. In addition, for the experience trainees can't acquire at their local unit, we recommend a placement at different institutions.

In order to understand the outlining of the section **attitudes** according to the CanMEDS classification in this curriculum, it is important to make the following disclaimer: At graduate level, physiotherapy is defined by the World Confederation on Physiotherapy (WCPT, a confederation of local and regional professional physical therapy professional associations) as follows: "Physical therapy involves the interaction between the physical therapist, patients/clients, other health professionals, families, care givers and communities in a process where movement potential is examined/assessed and goals are agreed upon, using knowledge and skills unique to physical therapists"². From this definition, it is clear that interactions with different stakeholders is in the core of the physiotherapists profession and training. At the entry-level to the profession the WCPT defined a number of 10 professional attitudes that are expected from physiotherapists at this stage. These attitudes are very closely related to those described in the CanMEDS system and include: Accountability, Altruism, Compassion/caring, Cultural competence, Ethical behaviour, Integrity, Personal and professional development, Professional duty, Social responsibility and advocacy, Teamwork³.

In the present postgraduate formation, the Task Force opted not to specifically name all professional attitudes that a physiotherapist should possess, but rather point out specific attitudes that can be evaluated for specific items of the curriculum on top of the Professional Behaviours outlined by the WCPT. It goes without saying that other attitudes of the CanMEDS model are also important in order to successfully execute the tasks dedicated to a physiotherapist (the CanMEDS framework is included below in the document for better convenience). It is noted that some of these roles, may be dependent on the job description. For example not all (respiratory) physiotherapists will be in a 'teaching' role towards scholars or in a 'leadership' position, even after obtaining a further professional competence in respiratory physiotherapy. Attitudes towards patients and other health care workers are, however required and implicit for all physiotherapists, including those with specialization in respiratory physiotherapy.

¹ Amin, Z., Chong, Y. S., & Eng, K.H. Practical guide to medical student assessment. World Scientific, 2006.

² World Confederation for Physical Therapy. WCPT Policy statement: description of physical therapy London, UK: WCPT; 2015. <http://www.wcpt.org/policy/ps-descriptionPT>

³ World Confederation for Physical Therapy. WCPT guideline for physical therapist professional entry level education. London, UK: WCPT; 2011. www.wcpt.org/guidelines/entry-level-education

List of abbreviations

ABG	Arterial blood gases	Mini-CEX	Mini clinical evaluation exercise
ACT	Airway clearance techniques	NIV	Non-invasive ventilation
ADL	Activities of Daily Living	NMD	Neuromuscular disorders
ATS	American Thoracic Society	NMES	Neuromuscular electrical stimulation
BLS	Basic Life Support	O₂	Oxygen
BPAP	Bi-level positive airway pressure	PEEP	Positive end expiratory pressure
CO₂	Carbon dioxide	PEP	Positive expiratory pressure
COPD	Chronic obstructive pulmonary disease	RMT	Respiratory muscle training
CPAP	Continuous positive airway pressure	VAPS	Volume assured pressure support
DOPS	Direct Observation of Procedural Skills		
ECG	Electrocardiogram		
ECMO	Extracorporeal membrane oxygenation		
ELTGOL	(fr. Effect of Slow Expiration with Glottis Opened in Lateral Posture)		
FET	Forced expiratory technique		
GPB	Glossopharyngeal breathing		
HFCWO	High frequency chest wall oscillations		
HFO	High flow oxygen		
HH	Heated humidifiers		
HME	Heat moisture exchanger		
ICU	Intensive care unit		
IPV	Intrapulmonary percussive ventilation		
MCQ	Multiple choice question		
MDT	Multidisciplinary team		
MHI	Manual hyperinflation		

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***General Curriculum Attitudes / Competencies (as dictated by the CanMEDS Physician Competency Framework)**

Medical Expert: Key Competencies	Enabling Competencies
<p>1. Practise medicine within their defined scope of practice and expertise</p> <p>2. Perform a patient-centred clinical assessment and establish a management plan</p> <p>3. Plan and perform procedures and therapies for the purpose of assessment and / or management</p> <p>4. Establish plans for ongoing care and, when appropriate, timely consultation</p> <p>5. Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety</p>	<p><i>1.1 Demonstrate a commitment to high-quality care of their patients</i></p> <p><i>1.2 Integrate the CanMEDS Intrinsic Roles into their practice of medicine</i></p> <p><i>1.3 Apply knowledge of the clinical and biomedical sciences relevant to their discipline</i></p> <p><i>1.4 Perform appropriately timed clinical assessments with recommendations that are presented in an organized manner</i></p> <p><i>1.5 Carry out professional duties in the face of multiple, competing demands</i></p> <p><i>1.6 Recognize and respond to the complexity, uncertainty, and ambiguity inherent in medical practice</i></p> <p><i>2.1 Prioritize issues to be addressed in a patient encounter</i></p> <p><i>2.2 Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion</i></p> <p><i>2.3 Establish goals of care in collaboration with patients and their families, which may include slowing disease progression, treating symptoms, achieving cure, improving function, and palliation</i></p> <p><i>2.4 Establish a patient-centred management plan</i></p> <p><i>3.1 Determine the most appropriate procedures or therapies</i></p> <p><i>3.2 Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy</i></p> <p><i>3.3 Prioritize a procedure or therapy, taking into account clinical urgency and available resources</i></p> <p><i>3.4 Perform a procedure in a skilful and safe manner, adapting to unanticipated findings or changing clinical circumstances</i></p> <p><i>4.1 Implement a patient-centred care plan that supports ongoing care, follow-up on investigations, response to treatment, and further consultation</i></p> <p><i>5.1 Recognize and respond to harm from health care delivery, including patient safety incidents</i></p> <p><i>5.2 Adopt strategies that promote patient safety and address human and system factors</i></p>
Communicator: Key Competencies	Enabling Competencies
<p>1. Establish professional therapeutic relationships with patients and their families</p> <p>2. Elicit and synthesize accurate and relevant information, incorporating the perspectives of patients and their families</p> <p>3. Share health care information and plans with patients and their families</p>	<p><i>1.1 Communicate using a patient-centred approach that encourages patient trust and autonomy and is characterised by empathy, respect, and compassion</i></p> <p><i>1.2 Optimize the physical environment for patient comfort, dignity, privacy, engagement, and safety.</i></p> <p><i>1.3 Recognize when the values, biases, or perspectives of patients, physicians, or other health care professionals may have an impact on the quality of care, and modify the approach to the patient accordingly.</i></p> <p><i>1.4 Respond to a patient's non-verbal behaviours to enhance communication</i></p> <p><i>1.5 Manage disagreements and emotionally charged conversations</i></p> <p><i>1.6 Adapt to the unique needs and preferences of each patient and to his or her clinical condition and circumstances</i></p> <p><i>2.1 Use patient-centred interviewing skills to effectively gather relevant biomedical and psychosocial information</i></p> <p><i>2.2 Provide a clear structure for and manage the flow of an entire patient encounter</i></p> <p><i>2.3 Seek and synthesize relevant information from other sources, including the patient's family, with the patient's consent</i></p> <p><i>3.1 Share information and explanations that are clear, accurate, and timely, while checking for patient and family understanding</i></p>

<p>4. Engage patients and their families in developing plans that reflect the patient’s health care needs and goals</p> <p>5. Document and share written and electronic information about the medical encounter to optimize clinical decision-making, patient safety, confidentiality, and privacy</p>	<p><i>3.2 Disclose harmful patient safety incidents to patients and their families accurately and appropriately</i></p> <p><i>4.1 Facilitate discussions with patients and their families in a way that is respectful, non-judgemental, and culturally safe.</i></p> <p><i>4.2 Assist patients and their families to identify, access, and make use of information and communication technologies to support their care and manage their health</i></p> <p><i>4.3 Use communication skills and strategies that help patients and their families make informed decisions regarding their health</i></p> <p><i>5.1 Document clinical encounters in an accurate, complete, timely, and accessible manner, in compliance with regulatory and legal requirements</i></p> <p><i>5.2 Communicate effectively using a written health record, electronic medical record, or other digital technology</i></p> <p><i>5.3 Share information with patients and others in a manner that respects patient privacy and confidentiality and enhances understanding</i></p>
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<p><u>Collaborator:</u> Key Competencies</p>	<p>Enabling Competencies</p>
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<p>1. Work effectively with physicians and other colleagues in the health care professions</p> <p>2. Work with physicians and other colleagues in the health care professions to promote understanding, manage differences, and resolve conflicts</p> <p>3. Hand over the care of a patient to another health care professional to facilitate continuity of safe patient care</p>	<p><i>1.1 Establish and maintain positive relationships with physicians and other colleagues in the health care professions to support relationship-centred collaborative care</i></p> <p><i>1.2 Negotiate overlapping and shared responsibilities with physicians and other colleagues in the health care professions in episodic and ongoing care</i></p> <p><i>1.3 Engage in respectful shared decision-making with physicians and other colleagues in the health care professions</i></p> <p><i>2.1 Show respect toward collaborators</i></p> <p><i>2.2 Implement strategies to promote understanding, manage differences, and resolve conflicts in a manner that supports a collaborative culture</i></p> <p><i>3.1 Determine when care should be transferred to another physician or health care professional</i></p> <p><i>3.2 Demonstrate safe handover of care, using both verbal and written communication, during a patient transition to a different health care professional, setting, or stage of care</i></p>
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<p><u>Leader:</u> Key Competencies</p>	<p>Enabling Competencies</p>
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<p>1. Contribute to the improvement of health care delivery in teams, organizations, and systems</p> <p>2. Engage in the stewardship of health care resources</p> <p>3. Demonstrate leadership in professional practice</p> <p>4. Manage career planning, finances, and health human resources in a practice</p>	<p><i>1.1 Apply the science of quality improvement to contribute to improving systems of patient care</i></p> <p><i>1.2 Contribute to a culture that promotes patient safety</i></p> <p><i>1.3 Analyze patient safety incidents to enhance systems of care</i></p> <p><i>1.4 Use health informatics to improve the quality of patient care and optimize patient safety</i></p> <p><i>2.1 Allocate health care resources for optimal patient care</i></p> <p><i>2.2 Apply evidence and management processes to achieve cost-appropriate care</i></p> <p><i>3.1 Demonstrate leadership skills to enhance health care</i></p> <p><i>3.2 Facilitate change in health care to enhance services and outcomes</i></p> <p><i>4.1 Set priorities and manage time to integrate practice and personal life</i></p> <p><i>4.2 Manage a career and a practice</i></p> <p><i>4.3 Implement processes to ensure personal practice improvement</i></p>
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<p><u>Health Advocate:</u> Key Competencies</p>	<p>Enabling Competencies</p>
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<p>1. Respond to an individual patient’s health needs by advocating with the patient within and beyond the clinical</p>	<p><i>1.1 Work with patients to address determinants of health that affect them and their access to needed health services or</i></p>
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<p>environment</p> <p>2. Respond to the needs of the communities or populations they serve by advocating with them for system-level change in a socially accountable manner</p>	<p><i>resources</i></p> <p>1.2 <i>Work with patients and their families to increase opportunities to adopt healthy behaviours</i></p> <p>1.3 <i>Incorporate disease prevention, health promotion, and health surveillance into interactions with individual patients</i></p> <p>2.1 <i>Work with a community or population to identify the determinants of health that affect them</i></p> <p>2.2 <i>Improve clinical practice by applying a process of continuous quality improvement to disease prevention, health promotion, and health surveillance activities</i></p> <p>2.3 <i>Contribute to a process to improve health in the community or population they serve</i></p>
<p>Scholar:</p> <p>Key Competencies</p>	<p>Enabling Competencies</p>
<p>1. Engage in the continuous enhancement of professional activities through ongoing learning</p> <p>2. Teach students, residents, the public, and other health care professionals</p> <p>3. Integrate best available evidence into practice</p> <p>4. Contribute to the creation and dissemination of knowledge and practices applicable to health</p>	<p>1.1 <i>Develop, implement, monitor, and revise a personal learning plan to enhance professional practice</i></p> <p>1.2 <i>Identify opportunities for learning and improvement by regularly reflecting on and assessing their performance using various internal and external data sources</i></p> <p>1.3 <i>Engage in collaborative learning to continuously improve personal practice and contribute to collective improvements in practice</i></p> <p>2.1 <i>Recognize the influence of role-modelling and the impact of the formal, informal, and hidden curriculum on learners</i></p> <p>2.2 <i>Promote a safe learning environment</i></p> <p>2.3 <i>Ensure patient safety is maintained when learners are involved</i></p> <p>2.4 <i>Plan and deliver a learning activity</i></p> <p>2.5 <i>Provide feedback to enhance learning and performance</i></p> <p>2.6 <i>Assess and evaluate learners, teachers, and programmes in an educationally appropriate manner</i></p> <p>3.1 <i>Recognize practice uncertainty and knowledge gaps in clinical and other professional encounters and generate focused questions that address them</i></p> <p>3.2 <i>Identify, select, and navigate pre-appraised resources</i></p> <p>3.3 <i>Critically evaluate the integrity, reliability, and applicability of health-related research and literature</i></p> <p>3.4 <i>Integrate evidence into decision-making in their practice</i></p> <p>4.1 <i>Demonstrate an understanding of the scientific principles of research and scholarly inquiry and the role of research evidence in health care</i></p> <p>4.2 <i>Identify ethical principles for research and incorporate them into obtaining informed consent, considering potential harms and benefits, and considering vulnerable populations</i></p> <p>4.3 <i>Contribute to the work of a research programme</i></p> <p>4.4 <i>Pose questions amenable to scholarly inquiry and select appropriate methods to address them</i></p> <p>4.5 <i>Summarise and communicate to professional and lay audiences, including patients and their families, the findings of relevant research and scholarly inquiry</i></p>
<p>Professional:</p> <p>Key Competencies</p>	<p>Enabling Competencies</p>
<p>1. Demonstrate a commitment to patients by applying best practices and adhering to high ethical standards</p>	<p>1.1 <i>Exhibit appropriate professional behaviours and relationships in all aspects of practice, demonstrating honesty, integrity, humility, commitment, compassion, respect, altruism, respect for diversity, and maintenance of confidentiality</i></p> <p>1.2 <i>Demonstrate a commitment to excellence in all aspects of practice</i></p> <p>1.3 <i>Recognize and respond to ethical issues encountered in practice</i></p> <p>1.4 <i>Recognize and manage conflicts of interest</i></p> <p>1.5 <i>Exhibit professional behaviours in the use of technology-enabled communication</i></p>

2. Demonstrate a commitment to society by recognizing and responding to societal expectations in health care

2.1 Demonstrate accountability to patients, society, and the profession by responding to societal expectations of physicians

2.2 Demonstrate a commitment to patient safety and quality improvement

3. Demonstrate a commitment to the profession by adhering to standards and participating in physician-led regulation

3.1 Fulfil and adhere to the professional and ethical codes, standards of practice, and laws governing practice

3.2 Recognize and respond to unprofessional and unethical behaviours in physicians and other colleagues in the health care professions

3.3 Participate in peer assessment and standard-setting

4. Demonstrate a commitment to physician health and well-being to foster optimal patient care

4.1 Exhibit self-awareness and manage influences on personal well-being and professional performance

4.2 Manage personal and professional demands for a sustainable practice throughout the physician life cycle

4.3 Promote a culture that recognizes, supports, and responds effectively to colleagues in need

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
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Module 1 Assessment of adult patients with respiratory conditions

Mandatory

Module Competency: *To assess adult patients presenting with respiratory conditions, and interpret findings*

CanMEDS Roles: *In this module, the following CanMEDS roles are identified: the Expert, Communicator, Collaborator, Professional, Scholar and Health Advocate. Specifically for 'Attitudes' the following roles are identified: Communicator (all items under point 1). Collaborator role (all items under points 1 + 2) is mainly relevant for assessment that are not performed by physiotherapist but by other health care providers. Other attitudes specifically relevant for certain subitems within this module are listed below.*



1. Anamnesis, inspection, general aspects	<ul style="list-style-type: none"> Discuss anatomy and physiology of the respiratory system Identify the risk factors for respiratory disorders Discuss the different respiratory conditions and their physiotherapeutic indications Classify body composition abnormalities and their relevance in respiratory patients Explain the medical history of the patient Recall the scales to judge the severity of disease Describe normal and abnormal signs at inspection of the thorax List the points of attention including shape of the thorax, breathing pattern, noises, use of accessory muscle important during inspection of the thorax Discuss patient willingness to alter lifestyle Document patient's smoking history 	<ul style="list-style-type: none"> Inspect and observe subtle signs of cardiorespiratory impairment Assess, measure and interpret the burden of a patient with respiratory disease Perform a patient assessment of primary problems as perceived by the patient Perform a medical history related to the respiratory diseases including social history, family history, pharmacology history, past and present medical history, lifestyle and health beliefs Assess patient willingness to alter lifestyle Plan assessment of a patient according to body structure and function, activity and participation 	<ul style="list-style-type: none"> Communicator: 2.1-2.3 	<p>Work-based/formal learning through: Courses</p> <p>Clinical internships</p>	<p>Oral/Written exam</p> <p>Clinical internship evaluation, Portfolio</p>	4	
2. Respiratory Pattern	<ul style="list-style-type: none"> Explain how breathing frequency and tidal volume are assessed Discuss physiological concepts of dead space ventilation and alveolar ventilation Discuss main mechanisms of control of breathing Explain how pathologies may result in different respiratory patterns Discuss indications and limitations of assessment in respiratory pattern Differentiate between types of normal and abnormal breathing patterns such as abdominal, thoracic, paradoxical Explain terminology related to pathological breathing patterns such as Cheyne-Stokes, ataxic, Kussmauls Review the impact of medical disorders on the breathing pattern and their consequence on ventilation and alveolar ventilation 	<ul style="list-style-type: none"> Assess a patient's breathing pattern in terms of frequency, amplitude, variation, and its appropriateness for the function of the patient Evaluate/Reassess the efficacy of the treatment Assess the changes in respiratory pattern during treatment 		<p>Work-based/formal learning through: Courses</p> <p>Clinical internships</p>	<p>Oral/Written exam</p> <p>Clinical internship evaluation, Portfolio</p>	4	
3. Dyspnoea	<ul style="list-style-type: none"> Discuss main physiological, pathophysiological, and psychological mechanisms leading to 	<ul style="list-style-type: none"> Select and apply appropriate assessment tools Decide on an initial physiotherapy treatment if 	<ul style="list-style-type: none"> Professional: 1.1 Communicator: 4.2, 4.3 		Oral/Written	4	

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	<p>dyspnoea</p> <ul style="list-style-type: none"> Name different descriptors of dyspnoea in different diseases (such as obstructive, restrictive, chronic, acute, neuromuscular disorders (NMD)) Explain terminology related to dyspnoea such as orthopnoea, tachypnoea, bradypnoea Explain how respiratory and non-respiratory conditions may result in and affect dyspnoea Discuss indications and limitations of assessment tools in dyspnoea including scales and questionnaires Discuss treatment strategies in dyspnoea in different diseases Using evidence, identify the clinical interventions most likely to have a clinically important benefit in terms of dyspnoea Differentiate accurately the types and severity of chronic and acute dyspnoea in individual patients Review the impact of medical disorders and lifestyle on the severity of dyspnoea 	<p>available for the patient to alleviate dyspnoea</p> <ul style="list-style-type: none"> Reassess the efficacy of the treatment Assess the changes in dyspnoea during treatment Adapt the treatment to the severity of dyspnoea measured in a patient 	<ul style="list-style-type: none"> Collaborator: 1.1 <p>Module specific attitudes:</p> <ul style="list-style-type: none"> Understand patient language around dyspnoea and be able to communicate in language understandable to patients around dyspnea. 		<p>exam</p> <p>Clinical internship evaluation,</p> <p>Portfolio</p>		
4. Auscultation and lung sounds	<ul style="list-style-type: none"> Discuss anatomy and physiology of the respiratory system related to auscultation State the basic physics leading to lung sounds Appraise normal lung sounds and explain how pathologies may result in altered sounds Discuss assessment of lung sounds and the presence of lung sounds to the application of respiratory physiotherapy practice Recognise the possible impact of altered lung sounds 	<ul style="list-style-type: none"> Perform auscultation to differentiate between lung sounds Use the appropriate direct or indirect techniques to reveal lung sounds such as percussion and palpation Instruct patients in order to perform auscultation According to guidelines, implement hygiene measures related to the use of a stethoscope 		<p>Controlled environment:</p> <p>Clinical Simulators</p> <p>Supervised bedside learning</p>	<p>Oral/Written exam</p> <p>Clinical internship evaluation,</p> <p>Case based (long/short case) examination</p>	3	
5. Cough and Mucus	<ul style="list-style-type: none"> Describe the rheology of mucus and how it affects mucus clearance Explain the physiological principles and mechanisms of mucus production and clearance and how it is affected by pathology and pharmacotherapy Explain how pathologies may result in abnormal cough and mucus production/retention Describe the different steps in effective coughing Discuss indications and limitations of assessment of cough List tools and methods for assessment of cough and mucus Differentiate between different types of cough Decide on an initial physiotherapy treatment for clearing excessive mucous if needed 	<ul style="list-style-type: none"> Use of appropriate assessment tools for cough (i.e. peak cough flow, peak expiratory flow, maximal expiratory pressure, lung volumes, etc.) Assess the changes in cough after pharmacological and non-pharmacological treatment Obtain sputum samples of good quality Use the appropriate assessment of quality and quantity of excessive mucus Assess the changes in mucus quality and quantity after pharmacological and non-pharmacological treatment 	<ul style="list-style-type: none"> Communicator: 3.1 	<p>Courses</p> <p>Clinical internships</p>	<p>Oral/Written exam</p> <p>Clinical internship evaluation,</p> <p>Portfolio</p>	4	
6. Pulmonary function test – assessment and	<ul style="list-style-type: none"> Differentiate between different types of pulmonary function tests Review the impact of medical disorders on the 	<ul style="list-style-type: none"> Perform basic pulmonary function tests to set-up or follow-up treatment Interpret a lung function report 		<p>Courses, watching video's including</p>	<p>Short answer question</p>	2	

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
interpretation	<p>lung functions</p> <ul style="list-style-type: none"> Describe the techniques used to measure static and dynamic lung volumes Describe the techniques used to assess diffusion capacity Distinguish the influence of diseases (e.g. lung defects, airway diseases, obesity, neurological and muscle disorders) on measurement parameters 	<ul style="list-style-type: none"> Use of appropriate assessment tools of lung functions (i.e. lung volumes, respiratory muscles strength) and outline medical strategies to manage it (i.e. drugs) Recognise normal signal quality versus artefact of measurement techniques Link the lung function impairment to therapeutic implications in rehabilitation and respiratory physiotherapy 		patient cases	<p>Multiple choice question (MCQ)</p> <p>Case reports</p>		
7. Limb muscle strength – assessment and interpretation	<ul style="list-style-type: none"> Recall concepts of strength, endurance Critique testing and discuss appropriate tests if required Describe the factors that increase the risk for muscle dysfunction in patients with lung diseases Differentiate between different types of muscle function tests Assess the normality of a test result in a given patient Decide on an initial physiotherapy treatment for skeletal muscle weakness if appropriate 	<ul style="list-style-type: none"> Appraise the limb muscle function Review the impact of medical disorders on the limb muscle strength (e.g. upper and lower limbs) Use of appropriate assessment tools of voluntary and involuntary limb muscle strength (i.e. medical council research scale, dynamometry, ultrasound, twitch stimulation) Compare normal signal quality versus artefact of measurement techniques including calibration 		<p>Courses, watching video's including patient cases</p> <p>Clinical internships</p>	<p>Oral/Written exam</p> <p>Clinical internship evaluation</p> <p>Portfolio</p>	4	
8. Respiratory muscle assessment	<ul style="list-style-type: none"> Describe methods for the assessment of respiratory muscle function Interpret results from assessment methods of respiratory muscles 	<ul style="list-style-type: none"> Execute tests used for assessment of respiratory muscles 		<p>Work-based learning performing procedures with patients</p> <p>Formal learning</p> <p>Management of patients in the clinical setting</p> <p>Case-based discussions</p>	<p>MCQ</p> <p>Direct Observation of Procedural Skills (DOPS)</p> <p>Portfolio</p> <p>Case-based examination</p>	4	Assessment of inspiratory and expiratory muscle strength and endurance in at least 5 patients under supervision and when competency is demonstrated, a minimum of 5 patients assessed alone
9. Blood gas - interpretation	<ul style="list-style-type: none"> Review the impact of medical disorders on the alveolar gas exchange (oxygen (O₂), carbon dioxide (CO₂)) Identify the normal range for blood gas parameters Discuss the normal and abnormal alveolar gas exchange Describe the influence of diseases (e.g. lung defects, airway diseases, obesity, neurological and muscle disorders) on measurement parameters Identify appropriate tests (direct or indirect measurements) to determine blood gas levels 	<ul style="list-style-type: none"> Use of appropriate assessment tools for non-invasive assessment of gas exchange (transcutaneous CO₂ and O₂) Compare normal signal quality versus artefact of measurement techniques including calibration Interpret level of blood gas of a patient with acutely and chronically deranged blood gases. 	<ul style="list-style-type: none"> Communicator: 4.2 <p>Module specific attitudes:</p> <ul style="list-style-type: none"> Clearly explain the effect of abnormal gas exchange to the patient and its consequences on treatments taking into account local legislation 	Courses	Oral/Written exam	2	
10. Basic interpretation of chest X- ray	<ul style="list-style-type: none"> Recall basic principles of radiology of the thorax and indications for chest X-ray Describe normal and pathological anatomy in chest-X-ray relevant for physiotherapists Recognize important radiological patterns relevant for the physiotherapist 	<ul style="list-style-type: none"> Assess patient's suitability to undergo each physiotherapeutic investigation 	Collaborator: all items under points 1 and 2	Courses and/or bedside teaching	Case reports	2	
11. Exercise capacity	<ul style="list-style-type: none"> Select the appropriate exercise assessment (see module 4) in a given clinical scenario 						

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
12. Physical activity	<ul style="list-style-type: none"> Recall recommended levels of physical activity in patient populations to maintain health and/or improve fitness Recall the different techniques to assess concepts related to physical activity Appraise the individual's normal and abnormal lifestyle and associated risks Describe the influence of diseases (e.g. lung defects, airway diseases, obesity, neurological and muscle disorders) on the physical activity 	<ul style="list-style-type: none"> Interpret the readout of an activity monitor Determine whether a patient needs a physical activity intervention Use of appropriate indirect (questionnaires) and direct assessment tools (monitors) Compare normal signal quality versus artefact of measurement techniques including calibration 	<ul style="list-style-type: none"> Health advocate: 1.2 and 1.3 <p>Module specific attitudes:</p> <ul style="list-style-type: none"> Clearly explain the effect of abnormal physical activity to the patient autonomy and associated risks 	<p>Courses</p> <p>Clinical internships</p>	<p>Oral/Written exam</p> <p>Clinical internship evaluation,</p> <p>Portfolio</p>	4	
13. Functional status/ activities of daily living	<ul style="list-style-type: none"> Recall and properly use the concept of activities of daily living (ADL) Identify generic and disease-specific instruments (questionnaires) Relate the effects of treatment on ADL Critique age-related differences in results of ADL Classify different field tests to assess functional ability 	<ul style="list-style-type: none"> Use and interpret commonly used ADL instruments (e.g. pulmonary functional status and dyspnoea questionnaire) Evaluate results of different instruments used in combination (i.e. basic ADL, London Chest ADL scale etc.) Appraise functional status in a patient using standard tests that apply to the specific patient population (intensive care unit (ICU), neuromuscular, chronic adult patient, elderly) 		<p>Courses</p> <p>Clinical internships</p>	<p>Oral/Written exam</p> <p>Clinical internship evaluation</p> <p>Portfolio</p>	4	

Module 2 Techniques for airway clearance in the adult patient

Mandatory

Module Competency	<i>To explain the rationale for airway clearance techniques and perform (select and apply) the appropriate treatment for each patient</i>						
CanMEDS Roles	<i>In this module the following CanMEDS roles are identified: the Expert, Communicator, Professional, and Scholar. Specifically for 'Attitudes' the following roles are identified: Communicator (point 3.1 and all subitems under point 4). Other attitudes specifically relevant for certain subitems within this module are listed below</i>						
1. Rationale and indications for airway clearance in the adult patient	<ul style="list-style-type: none"> Describe the physiology of normal airway clearance mechanisms in adults Discuss pathological mechanisms of airway clearance and identify respiratory pathologies which may affect natural airway clearance Explain rationale for use of airway clearance techniques (ACT) in adult patients Discuss other opportunities for airway clearance with regard to forced/slow expiration techniques at different lung volumes Summarise indications and contraindication for use of ACT in adult patients Explain the factors that influence airway clearance in different disease states 	<ul style="list-style-type: none"> Identify factors affecting normal airway clearance Evaluate effectiveness of ACT Evaluate the benefit of ACT in each disease state 	<ul style="list-style-type: none"> Scholar:1.1, 1.2 	<p>Self-directed learning: literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed</p> <p>Formal learning: (ERS school courses or equivalent)</p> <p>Learning with other professionals: participate in case-based discussions</p>	<p>Logbook of patients/portfolio centre</p> <p>MCQ</p>	2	<p>Manage and treat airway clearance in at least 10 patients under supervision and when competency is demonstrated, a minimum of 10 patients managed alone</p>

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
2. Body positioning for secretion clearance	<ul style="list-style-type: none"> Summarise the mechanism of action for body position in secretion clearance Discuss the benefits and pitfalls for using body position to enhance airway clearance in adult patients Explain selection of body positioning in relation to airway anatomy Describe the indications and contraindications for use of body positioning for secretion clearance 	<ul style="list-style-type: none"> Apply and evaluate the indications for the use of body position (gravity assisted postural drainage) as a method of airway clearance Adjust body positioning to patient's pathology and co-morbidities Demonstrate how and teach positioning for self-management to patients and family Evaluates patient tolerance of body positioning 		<ul style="list-style-type: none"> Self-directed learning, literature search and appraisal. Courses, watching videos Management of patients in clinical practice. Learning with other professionals: participate in case-based discussions 	<ul style="list-style-type: none"> Practical exam MCQ Mini Clinical Evaluation exercise (Mini-CEX) Portfolio Clinical log book DOPS 	4	
3. Forced expiration, active cycle of breathing techniques, autogenic drainage	<ul style="list-style-type: none"> Describe forced expiration technique, active cycle of breathing techniques, autogenic drainage Describe rationale for forced expiratory technique (FET), active cycle of breathing techniques, autogenic drainage mobilises secretions Justify use of FET, active cycle of breathing techniques, autogenic drainage Review the evidence for the use of FET, active cycle of breathing techniques, autogenic drainage mobilise secretions base in respiratory disease Describe the indications and contraindications for use FET, active cycle of breathing techniques, autogenic drainage 	<ul style="list-style-type: none"> Design and evaluate treatment using FET, active cycle of breathing techniques, autogenic drainage Demonstrate how to perform patient assessment to identify patients who may benefit from FET, active cycle of breathing techniques, autogenic drainage Demonstrate clearly how to instruct patients and ensure correct performance and understanding for each technique Measure sputum expectoration and evaluate the consistency, texture and colour Evaluates patient tolerance of treatment therapy 		<ul style="list-style-type: none"> Self-directed learning, literature search and appraisal. Courses, watching videos Management of patients in clinical practice. Learning with other professionals: participate in case-based discussions 	<ul style="list-style-type: none"> Practical exam MCQ Portfolio Clinical log book DOPS 	4	
4. Manual chest wall techniques	<ul style="list-style-type: none"> Describe manual techniques (clapping, shaking and vibrations), manually assisted cough Summarise the mechanism of action for manual techniques (clapping, shaking and vibrations,) manually assisted coughing, effect of slow expiration with glottis opened in lateral posture (ELTGOL) Discuss the benefits and pitfalls for using manual techniques (clapping, shaking and vibrations), manually assisted coughing, ELTGOL, to enhance airway clearance Describe how these techniques can be modified or combined to enhance airway clearance Review the evidence base for the use of manual techniques (clapping, shaking and vibrations), manually assisted coughing, ELTGOL, manual hyperinflation (MHI), air stacking and glossopharyngeal to enhance airway clearance in obstructive and restrictive lung disease Select technique based on evidence and appropriateness of the patient's clinical context Design a treatment programme incorporating agreed treatment of choice taking into account the patient's clinical context 	<ul style="list-style-type: none"> Demonstrate how to assess the appropriateness of each technique in the clinical context Perform patient assessment to identify patients who may benefit from manual techniques, assisted coughing, ELTGOL Evaluate the effectiveness of your chosen treatment programme with regards to your patient. Effectiveness may be evaluated for example by sputum production, improvements in O₂ saturation, lung function, decreased O₂ requirement, decreased breathlessness etc. Adequately inform and prepare the patient for their treatment programme Evaluates patient tolerance of treatment therapy Demonstrate to the patient air stacking and glossopharyngeal breathing (GPB) 		<ul style="list-style-type: none"> Self-directed learning, literature search and appraisal. Management of patients in clinical practice. Learning with other professionals: participate in case-based discussions Courses, watching videos 	<ul style="list-style-type: none"> Practical exam MCQ Mini-CEX Portfolio Clinical log book DOPS 	4	

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
5. Increasing lung volumes for airway clearance	<ul style="list-style-type: none"> Describe MHI, air stacking and GPB Summarise the mechanism of action MHI, air stacking and glossopharyngeal, with regards to ACT Discuss the benefits and pitfalls of MHI, air stacking and glossopharyngeal to enhance airway clearance Describe how these techniques can be modified or combined to enhance airway clearance Review the evidence base for the use of MHI, air stacking and glossopharyngeal to enhance airway clearance in restrictive and obstructive lung disease Select technique based on evidence and appropriateness of the patient's clinical context Design a treatment programme incorporating agreed treatment of choice taking into account the patient's clinical context 	<ul style="list-style-type: none"> Evaluate the effectiveness of your chosen treatment programme with regards to your patient. Effectiveness may be evaluated for example by sputum production, improvements in O₂ saturation, lung function, decreased O₂ requirement, decreased breathlessness etc. Apply appropriate depth of breath and respiratory rate according to the patients spontaneous breathing cycle when using manual MHI and air stacking Demonstrate clearly how to instruct patients and ensure correct performance and understanding of GPB Perform patient assessment to identify patients who may benefit from MHI and GPB 		<p>Self-directed learning: literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed</p> <p>Formal learning: (ERS school courses or equivalent)</p> <p>Learning with other professionals: participate in case-based discussions</p>		4	
6. Devices for airway clearance	<ul style="list-style-type: none"> Describe positive expiratory pressure (PEP), oscillatory PEP, intrapulmonary percussive ventilation (IPV), high frequency chest wall oscillations (HFCWO), in/exsufflation assisted-cough, non-invasive ventilation (NIV), identifying examples of oscillatory PEP devices Summarise the mechanism of action for PEP, oscillatory PEP, IPV, HFCWO, NIV, in/exsufflation assisted-cough with regards to ACT Discuss the clinical benefits and pitfalls for PEP, oscillatory PEP, IPV, HFCWO, NIV, in/exsufflation assisted-cough to enhance airway clearance Describe how these techniques can be modified or combined to enhance airway clearance Review the evidence base for the use of PEP, oscillatory PEP, IPV, NIV, HFCWO, in/exsufflation assisted-cough in respiratory disease 	<ul style="list-style-type: none"> Assess the appropriateness of each technique in the clinical context Measure sputum expectoration and evaluate the consistency, texture and colour Evaluate patient tolerance of treatment therapy Choose PEP resistance in relation to patient's condition Select positive and negative pressure in/exsufflation assisted-cough according to patient's condition and tolerance Select settings for NIV to assist airway clearance according to patient's condition and tolerance e.g. based on estimated predicted values for vital capacity Demonstrate selection of interfaces for in/exsufflation assisted-cough and NIV their application Match the choice of treatment to the patient's condition Teach patients and their family technique, equipment handling and care Select technique based on evidence and appropriateness of the patient's clinical context Design a treatment programme incorporating agreed treatment of choice taking into account the patient's clinical context Evaluate the effectiveness of your chosen treatment programme with regards to your patient. Effectiveness may be evaluated for example by sputum production, improvements in O₂ saturation, lung function, decreased O₂ requirement, decreased breathlessness, and improved functional capacity etc. Discuss selection of vest size for HFCWO and hygiene issues Evaluate patient tolerance of treatment therapy 		<p>Self-directed learning: literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed</p> <p>Formal learning: (ERS school NIV courses or equivalent)</p> <p>Learning with other professionals: participate in case-based discussions</p> <p>Courses, watching videos</p>	<p>Practical exam</p> <p>MCQ</p> <p>Mini-CEX</p> <p>Portfolio</p> <p>Clinical log book</p> <p>DOPS</p>	4	

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
7. Aerosol therapy and humidification	<ul style="list-style-type: none"> List the aerosol medications that maybe used to enhance airway clearance Identify aerosol treatments that are specific to a disease pathology Discuss the indications and contraindications for aerosol therapy as an adjunct to airway clearance Describe the different methods of delivery for aerosol therapy as an adjunct to airway clearance Justify the use of therapy with the relevant evidence Select appropriate timings for aerosol therapy Describe the role of humidification in enhancing airway clearance Explain how humidification works Identify when humidification is indicated List the contraindications to humidification Discuss the different forms of humidification available to the respiratory physiotherapist 	<ul style="list-style-type: none"> Identify appropriate patients who may benefit from aerosol therapy or humidification as an adjunct to airway clearance Assess the effectiveness of aerosol therapy Explain or perform bronchoconstriction and bronchodilation trials Explain or perform hypertonic saline as a treatment and assess sputum production Explain or perform ultrasonic nebulisation therapy Examine the effect of giving DNase for secretion clearance in patients with cystic fibrosis Initiate humidified O₂ therapy Initiate aerosol therapy at appropriate times for effective airway clearance Select appropriate timings for aerosol therapy 		<p>Self-directed learning: literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed</p> <p>Formal learning: (ERS school courses or equivalent)</p> <p>Learning with other professionals: participate in case-based discussions</p> <p>Courses, watching videos</p>	<p>Practical exam</p> <p>MCQ</p> <p>Mini-CEX</p> <p>Portfolio</p> <p>Clinical log book</p> <p>DOPS</p>	4	<p>Assess, treat and evaluate 20 patients with humidification</p>
8. Airway suctioning	<ul style="list-style-type: none"> Explain rationale and mechanism of action for airway suctioning Describe airway suctioning procedure in line with local protocols Differentiate between the different types of airway suction Differentiate between artificial airways that can be used for airway suctioning Define the indications and contraindications of airway suctioning and artificial airways Evaluate the risks and emergency of airway suctioning 	<ul style="list-style-type: none"> According to local protocols, perform patient assessment to identify need for airway suctioning for example a patient who has an ineffective cough and you are unable to clear secretions with other techniques or a patient who has inability to cooperate with treatment Demonstrate the insertion of artificial airways into the mannequin Demonstrate nasal pharyngeal, oral suction and deep suction on a mannequin 		<p>Self-directed learning: literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed</p> <p>Formal learning: (ERS school courses or equivalent)</p> <p>Learning with other professionals: participate in case-based discussions</p> <p>Watching videos and Simulation</p>	<p>MCQ</p> <p>Simulation</p>	3	<p>Observe and evaluate airway suction in 10 patients</p> <p>Perform airway suction on a mannequin (or patient, if allowed by local regulations) at least 10 times with external assessment</p>
9. Exercise as a technique for airway clearance	<ul style="list-style-type: none"> Describe the role of exercise therapy for airway clearance. Summarise the mechanism of action for exercise therapy for airway clearance Discuss the benefits and pitfalls for exercise therapy for airway clearance Review the evidence base for the use of exercise therapy for airway clearance in respiratory conditions Describe the indications and contraindications for use of exercise as an ACT Design an exercise treatment programme for airway clearance 	<ul style="list-style-type: none"> Perform patient assessment to identify the appropriateness for exercise therapy in the clinical context Select appropriate exercise therapy and intensity for chest clearance Evaluate the exercise programme based on patient assessment of sputum production, lung function, patient feedback, and exacerbations Evaluates patient tolerance of treatment therapy 		<p>Self-directed learning: literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed</p> <p>Formal learning: (ERS school courses or equivalent)</p> <p>Learning with other professionals:</p>	<p>Practical exam</p> <p>MCQ</p> <p>Mini-CEX</p> <p>Portfolio</p> <p>Clinical log book</p> <p>DOPS</p>	4	

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
				participate in case-based discussions			
10. Self-management techniques/education for airway clearance	<ul style="list-style-type: none"> Summarise the impact of self-management techniques/education Describe the risks of secretion retention and benefits of simple therapeutic interventions Discuss the barriers to self-management Justify treatment modalities for the patient and their condition 	<ul style="list-style-type: none"> Perform a patient assessment to identify the barriers to patient's adherence in self-management Teach patients, their families and cares how to self-manage secretion clearance at home Design and execute self-management programmes for patients with secretion encumbrance 	<ul style="list-style-type: none"> Health advocate: 1.2 and 1.3 	<ul style="list-style-type: none"> Self-directed learning: literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed Case based discussion Formal learning: (ERS school courses or equivalent) Learning with other professionals: participate in case-based discussions Watching videos and Simulation 	<ul style="list-style-type: none"> MCQ Case based examination Simulation 	3	
11. Summarising the evidence and reference to evidence-based documents	<ul style="list-style-type: none"> Review research evidence on ACT in different conditions Analyse international and national guidelines to consider new evidence and remain up to date Describes the methodology of producing clinical guidelines for airway clearance Distinguishes between types of evidence-based medicine publications (i.e. recommendations, guidelines, position papers) Explains the legal implications in evidence-based medicine Critically review research paper and discuss implication for practice and limitations Keep up to date with advances in the field 	<ul style="list-style-type: none"> Apply recommendations from evidence-based publications to patient care 	<ul style="list-style-type: none"> Scholar: 1.1, 1.2, 3.1, 3.3, 3.4 	<ul style="list-style-type: none"> Self-directed learning: appraisal of a scientific article related to the clinical presentation of a patient currently being managed Case based discussion (face to face) and in online environment Literature review 	<ul style="list-style-type: none"> MCQ Case based examination 	2	<ul style="list-style-type: none"> Discussion of 5 cases using evidence-based medicine Participation in 2 seminars on evidence-based medicine

Module 3 Respiratory muscle training, breathing strategies and techniques for lung expansion

Mandatory

Module Competency	<i>Explain rationale and perform respiratory muscle training, breathing strategies and techniques for lung expansion</i>
CanMEDS Roles	In this module the following CanMEDS roles are identified: the Expert, Communicator, Collaborator, Professional, and Scholar. <i>Specifically for 'Attitudes' the following roles are identified: Communicator (point 3.1 and all subitems under point 4). Other attitudes specifically relevant for certain subitems within this module are listed below.</i>

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
							
1. Rationale and indications	<ul style="list-style-type: none"> Recall normal breathing Identify abnormalities in breathing pattern and respiratory muscles based on current guidelines (such as American Thoracic Society (ATS), or ERS) on pulmonary rehabilitation or another relevant guideline Identify the rationale for use of lung expansion 	<ul style="list-style-type: none"> Assess breathing pattern and respiratory muscles to identify need/indication for respiratory muscle training, breathing strategies and lung expansion techniques Observe and examine breathing pattern and respiratory muscles 		<p>Work-based learning</p> <p>Formal learning</p> <p>For instance: Watch videos</p> <p>Observation of clinical demonstration</p>	<p>MCQ</p> <p>Portfolio</p> <p>DOPS</p> <p>Objective structured clinical examination</p>	4	
2. Respiratory muscle training (RMT)	<ul style="list-style-type: none"> Recall respiratory muscle assessment from module 1 Compare effects, indications, advantages and disadvantages of different training types Describe characteristics of inspiratory/ respiratory muscle training 	<ul style="list-style-type: none"> Identify patients who may benefit from RMT Organise individually tailored RMT 	<ul style="list-style-type: none"> Scholar: 1.1, 1.2 	<p>Work-based learning with performing procedures with patients</p> <p>Formal learning</p> <p>For instance: Management of patients in the clinical setting</p>	<p>MCQ</p> <p>DOPS</p> <p>Portfolio</p> <p>Case-based examination</p>	4	Manage at least 5 patients with respiratory muscle weakness under supervision and when competency is demonstrated manage another 5 alone.
3. Breathing strategies and breathing exercises	<ul style="list-style-type: none"> Outline peculiarities of respiratory training in patients with respiratory disorders Outline breathing strategies and exercises to manage patient's breathlessness at rest and during exercises e.g. leaning forward, pursed lips breathing and active expiration Discuss rationale for breathing strategies and exercises for management of breathlessness and breathing pattern retraining Prescribe effective breathing exercises including relaxation when indicated List body positions that relieve breathlessness and summarise the mechanism of action. Describe the indication for positions that relieve breathlessness. Discuss breathing strategies for dysfunctional breathing (for example hyperventilation syndrome, dysfunctional cough) 	<ul style="list-style-type: none"> Identify patients with abnormal breathing Clinically assess patients with abnormal breathing; dysfunctional breathing, hyperventilation etc. Assess end tidal CO₂ Organise individually tailored breathing retraining Prescribe individual breathing exercises based on the patient's condition and assessment Demonstrate, instruct, supervise and motivate patients to perform appropriate strategies and exercises with the correct techniques Perform tests/assessments to identify reasons for abnormal breathing pattern Apply and evaluate the indications for the use of body positioning to relieve breathlessness 		<p>Work-based learning with performing procedures with patients and learning hands-on</p> <p>Formal learning</p> <p>For instance: Management of patients in the clinical setting</p>	<p>MCQ</p> <p>DOPS</p> <p>Portfolio</p>	4	Manage at least 5 patients with abnormal breathing,
4. Techniques for lung expansion	<ul style="list-style-type: none"> Describe techniques for lung expansion Discuss the benefits and pitfalls for using lung expansion techniques Review the evidence base for the use of lung expansion techniques Determine need and eligibility of patient for lung expansion 	<ul style="list-style-type: none"> Assess the appropriateness of each technique Identify patients who may benefit from lung expansion Based on evidence for the underlying pathology and condition and the results of the diagnostic tests select the appropriate technique and evaluate the effectiveness of the chosen treatment 		<p>Work-based learning with performing procedures with patients</p> <p>Formal learning</p> <p>For instance: Management of</p>	<p>MCQ</p> <p>Portfolio</p> <p>Case-based examination</p> <p>DOPS</p>	4	Manage at least 5 patients using lung expansion techniques

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
		<ul style="list-style-type: none"> Adequately inform and prepare the patient Evaluates patient tolerance of treatment therapy Evaluate treatment programmes Select technique for lung expansion 		patients in the clinical setting			
5. Summarising the evidence and reference to evidence-based documents	<ul style="list-style-type: none"> Appraise scientific evidence and evidence-based guidelines Evaluate level of evidence according to widely accepted tools for quality assessment Assemble the available evidence and choose evidence-based treatments for the given condition first (if available) before considering alternative treatment options based on clinical reasoning or physiological considerations. Conduct critical literature appraisal Keep up to date with advances within the field 	<ul style="list-style-type: none"> Apply recommendations from evidence-based publications to patient care 	<ul style="list-style-type: none"> Scholar: 1.1, 1.2, 3.1, 3.3, 3.4 	<p>Formal learning / self-directed learning through literature review</p> <p>Grade quality of studies to determine level of evidence for intervention.</p>	<p>MCQ</p> <p>Case-based examination</p>	2	<p>Perform at least one literature review related to a concrete clinical case</p> <p>Participation in 2 seminars using evidence-based medicine approach</p>

Module 4 Exercise training and physical activity

Mandatory

Module Competency	To explain physiological response to exercise in lung disease and the rationale for exercise training and physical activity interventions. Based on appropriate assessment prescribe and implement a programme of exercise training or physical activity in individual patients.						
CanMEDS Roles	<p>In this module the following CanMEDS roles are identified: the Expert, Communicator, Collaborator, Professional, and Scholar.</p> <p><i>Specifically for 'Attitudes' the following roles are identified: Communicator (all items under point 1). Collaborator role (all items under points 1 - 3) is mainly relevant for assessment that are not performed by physiotherapist but by other health care providers. Other attitudes specifically relevant for certain subitems within this module are listed below.</i></p>						
1. Rationale, exercise physiology and physical activity	<ul style="list-style-type: none"> Recall basic exercise physiology including cardiovascular and respiratory responses and adaptations to exercise Explain the determinants of strength/weakness, fatigability, power of human muscle and the adaptations to strength training. Explain general concepts of physical activity including definitions and different types of physical activity Summarise possible abnormalities and deficits in exercise capacity including ventilatory limitations, gas exchange limitations, cardiac limitations, peripheral and respiratory muscle dysfunction, based on current guidelines (such as ATS or ERS) on pulmonary rehabilitation Infer the rationale for exercise training in patients with lung diseases by taking into account these abnormalities and deficits in exercise capacity or functional performance To explain the differences in selection, application and interpretation of appropriate exercise testing procedures and appropriate 		<ul style="list-style-type: none"> Scholar: 1.1, 1.2 	<p>Controlled environment:</p> <p>Courses</p> <p>Case based discussion (face to face) and in online environment</p>	<p>MCQ</p> <p>Oral examinations</p>	2	

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	modification to exercise prescription in relation to musculoskeletal frailty or vulnerability, co-morbidities, motivation						
2. Assessment of physical fitness (exercise capacity, muscle strength and endurance, balance, flexibility)	<ul style="list-style-type: none"> Describe methods for assessing exercise capacity (e.g., cardiorespiratory exercise test, 6-minute walk test, shuttle walk tests, –simple functional test of performance), muscle strength and endurance (e.g., dynamometry, 1-repetition maximum (see module1), balance (e.g., force plates and Berg Balance Scale) and flexibility. Interpret results of the various methods correctly and describe possible implications for exercise training Interpret exercise limitations based on the results of a maximal exercise test Interpret peripheral and respiratory muscle function 	<ul style="list-style-type: none"> Perform and interpret a six-minute walk test Perform and interpret a shuttle walk test (incremental and endurance) Perform and interpret a measurement of peripheral muscle strength using maximal voluntary efforts Perform and interpret simple functional tests Perform and interpret a validated balance test Perform and interpret a validated flexibility test Re-evaluate the response to an exercise programme Choose the most appropriate test to assess physical fitness in a patient 		<p>Work-based environment:</p> <p>Portfolio</p> <p>Exercise protocols</p> <p>Case-based discussions</p>	<p>MCQ</p> <p>DOPS</p> <p>Portfolio</p> <p>Case-based examination</p>	4	<p>Assess the indication and prescription for exercise training and/or physical activity programmes in at least 5 patients under supervision and when competency is demonstrated, a minimum of 5 patients assessed alone. (whole module)</p> <p>Interpret exercise limitations in at least 10 maximal exercise test protocols. Observe at least 5 maximal exercise tests</p>
3. Assessment of physical activity	<ul style="list-style-type: none"> Recall guidelines of the American Colleges of Sports Medicine in light of physical activity in health and disease Describe methods for assessing physical activity such as motion sensors (pedometers, accelerometers), questionnaires and activity logs or diaries Discuss pros, cons and indications of the various methods used to assess physical activity Interpret results from assessments of physical activity Interpret and compare the results of physical activity assessment taking into account the validity of the used instruments and their applicability 	<ul style="list-style-type: none"> Perform objective (pedometer, accelerometer) and subjective assessments of physical activity in patients Perform and interpret assessments of physical activity Choose the most appropriate test to assess physical activity in a patient 	<p>Module specific attitudes:</p> <ul style="list-style-type: none"> Demonstrate an understanding the complexities of behaviour change concerning the assessment of physical activity and identify the barriers and potential solutions to optimize adherence to individual needs 	<p>Work-based environment</p> <p>Case-based discussion</p>	<p>MCQ</p> <p>DOPS</p> <p>Portfolio</p> <p>Case-based examination</p>	4	
4. Exercise training principles	<ul style="list-style-type: none"> Describe general principles of exercise training Describe characteristics of anaerobic training (endurance and interval) resistance training, flexibility-, and balance training, neuromuscular electrical stimulation (NMES), in patients with respiratory disorders Summarise the anticipated effects of the various training modalities in different disease severities based on current guidelines (such as ATS, or ERS) on pulmonary rehabilitation Compare effects, indications, advantages and disadvantages of different training modalities 			<p>Controlled environment:</p> <p>Courses</p> <p>Case based discussion (face to face) and in online environment</p>	<p>MCQ</p> <p>Case-based examination</p>	2	
5. Prescribing exercise training	<ul style="list-style-type: none"> Describe effective exercise training, including type of exercise, frequency, intensity, duration, time and progression of training Describe effective NMES including the advantages and disadvantages of different devices and characteristics of the technique in patients unable to exercise 	<ul style="list-style-type: none"> Individually prescribe the appropriate modality and training regime based on the status of the patient Control the intensity and progression of the training based on patient's response Correctly apply intensity and frequency for NMES 	<ul style="list-style-type: none"> Health advocate: 1.2 <p>Module specific attitudes:</p> <ul style="list-style-type: none"> Display sensitivity to patient 's tolerance, preferences and difficulties in the application of intensity, frequency, 	<p>Work-based environment:</p> <p>Management of patients in the clinical setting</p>	<p>MCQ</p> <p>Portfolio</p> <p>Case-based examination</p>	4	

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	<ul style="list-style-type: none"> Describe exercise training in patients under different conditions such as stable, exacerbated or pre/post-operative Identify patients who may benefit from different types and settings of exercise training Identify patients in need of maintenance training Recognize physical or psychological conditions that may be hindering the performance of or the benefits from exercise training 		duration, time, type of exercise and progression of training	(such as management of a patient to maintain an improved physical fitness on a long-term basis)			
6. Exercise training in patients with comorbidity; relative and absolute contra-indications	<ul style="list-style-type: none"> Identify common comorbid conditions in patients with respiratory disorders such as heart disease, diabetes, osteoporosis, obesity, hypertension, peripheral artery diseases, mood disorders Outline peculiarities of exercise training in patients with different comorbid conditions Describe effective exercise training to patients with comorbid conditions Explain indications and contraindications for exercise training in patients with comorbidity Outline and recognise the risks of exercise training in patients with comorbidity 	<ul style="list-style-type: none"> Identify if patient has contraindication for exercise training Prescribe individual exercise training based on the patient's condition, and assessment including exercise testing (see previous items in this module) Choose the appropriate modality and training regime based on the patient's condition Frequently monitor the risks of the patient's condition and modify training regime according to assessment Use re-assessment to appropriately modify type, frequency, intensity, duration, time and progression of exercise training according to preference and co-morbidities 	<ul style="list-style-type: none"> Collaborator: 3.1 <p>Module specific attitudes:</p> <ul style="list-style-type: none"> Display sensitivity to patient's condition, tolerance, preferences and difficulties in the application of intensity, frequency, duration, time, type of exercise and progression of training 	<p>Work-based environment: Management of patients in the clinical setting</p> <p>(For instance: Management of a patient with comorbidity and decreased physical fitness</p> <p>Management of a patient with comorbidity to maintain an improved physical fitness on a long-term basis)</p>	<p>MCQ</p> <p>Portfolio</p> <p>Case-based examination</p>	4	Discuss with the multidisciplinary team (MDT) at least 5 times the exercise training and its effect on a patient with comorbid disorder
7. Adjuncts to exercise training (O ₂ therapy, non-invasive ventilation (NIV), breathing strategies, walking aids)	<ul style="list-style-type: none"> Summarise the rationale for the use of supplemental O₂ at rest and during exercises, NIV, breathing strategies (pursed lips, active expiration and leaning forward), and walking aids as adjuncts to exercise training Explain how and when to apply adjuncts to exercise training and to which patients Describe how different adjuncts to exercise training enhance exercise capacity Discuss pros, cons and indications of the various adjuncts Explain how the different adjuncts to exercise training can be used Describe the safety regulations for storing and using O₂ at home Describe the monitoring of patients during training who use adjuncts 	<ul style="list-style-type: none"> Assess the appropriateness of each technique in the clinical context Identify patients who may benefit from the combination of exercise training and the adjuncts; supplemental O₂, NIV, pursed lip breathing, diaphragmatic breathing and walking aids Select adjunct based on evidence and evaluation of method effectiveness in the individual patient Evaluate patient tolerance of the selected adjunct Teach patient how to breathe while inspiring supplemental O₂, using NIV, or walking aids Teach patient how to perform pursed lip breathing or diaphragmatic breathing during exercise training Select appropriate device for O₂ supplementation and NIV Titrate O₂ in relation to patient's condition during exercise training according to guidelines Choose equipment and technique for NIV according to patient's condition and tolerance Measure O₂ saturation and evaluate the effectiveness of supplemental O₂ during exercise and on a long-term basis Measure O₂ saturation and evaluate the effectiveness of breathing strategies, NIV and walking aids during exercise 	<p>Module specific attitudes:</p> <ul style="list-style-type: none"> Recognize the possible impact of exercise training with adjuncts on patient's lifestyle and safety 	<p>Work-based environment:</p> <p>Management of patients in the clinical setting</p> <p>(such as Manage a patient with long-term O₂ therapy in exercise training)</p>	<p>MCQ</p> <p>Portfolio</p> <p>Case-based examination</p>	4	

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
		<ul style="list-style-type: none"> • Titrate correct amount of O₂ to patients in need of supplemental O₂ during exercise • Teach patients and their families the techniques for equipment handling • Assess adherence to O₂ therapy during exercise and promote intervention to enhance it in case of poor adherence. 					
8. Enhancing physical activity	<ul style="list-style-type: none"> • Describe available therapeutic methods; activity counselling, theory based behavioural medicine interventions, activity monitors, training logs, and exercise programmes to enhance daily physical activity • Compare and contrast the different methods to enhance daily physical activity and for which patient each method is suitable are there conditions to be considered here? e.g. specific to individual's diagnosis / treatment management • Discuss pros, cons and indications of the various methods • Describe different theory based behavioural medicine interventions and explain the possible benefits 	<ul style="list-style-type: none"> • Choose the most adequate therapeutic method; activity counselling, theory based behavioural medicine intervention, activity monitor, training log, and exercise programme to be applied in each individual • Clearly communicate the benefits and strategies of enhancing physical activity level with the patient and family 	<ul style="list-style-type: none"> • Collaborator: 3.1 • Health advocate: 1.2 <p>Module specific attitudes:</p> <ul style="list-style-type: none"> • Collaborate with the MDT to discuss physical and psychological barriers to physical activity in patients and the proposed individual physical activity strategies for the patient. 	<p>Work-based environment:</p> <p>Management of a patient with decreased physical activity</p>	<p>MCQ</p> <p>Portfolio</p> <p>Case-based examination</p>	4	
9. Summarising the evidence and reference to evidence-based documents	<ul style="list-style-type: none"> • Appraise scientific evidence and evidence-based guidelines • Distinguish between types of evidence-based publications (i.e. recommendations, guidelines, position papers) • Evaluate level of evidence of applied interventions by reading and implementing the results of systematic reviews • Conduct critical literature appraisal by quality review 	<ul style="list-style-type: none"> • Interpret and apply recommendations from evidence-based publications in physical activity and exercise to patients 	<ul style="list-style-type: none"> • Scholar: 1.1, 1.2, 3.1, 3.3, 3.4 	<p>Formal learning in a controlled environment:</p> <p>Courses</p> <p>Case based discussion (face to face) and in online environment</p> <p>Appraisal of a scientific article related to clinical work</p>	<p>MCQ</p> <p>Case-based examination</p>	2	<p>Discuss 5 cases using evidence-based medicine</p> <p>Participation in at least 2 seminars using evidence-based medicine approach</p>

Module 5 Peri operative physiotherapy in a spontaneously breathing patient (for invasively ventilated patients, see module 9)

Mandatory

Module Competency
To explain the effects of major surgical interventions and other risk factors on respiratory function. To apply therapeutic options for the pre- and post-operative period.

CanMEDS Roles
In this module the following CanMEDS roles are identified: the Expert, Communicator, Collaborator, Professional, and Scholar.



Specifically for 'Attitudes' the following roles are identified: Communicator (all items under point 1). Collaborator role (all items under points 1 - 3) is mainly relevant for assessment that are not performed by physiotherapist but by other health care providers. Other attitudes specifically relevant for certain subitems within this module are listed below.

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
1. Principles of cardiorespiratory dysfunction following surgery	<ul style="list-style-type: none"> List the types of surgery that may affect respiratory function such as thoracotomy and pneumonectomy Outline anatomic and physiological changes and dysfunctions associated with thoracic and/or abdominal surgery and general anaesthesia Identify the causes of post-operative complications which involve respiratory (dys)function Explain appropriate outcome measures for identifying cardiorespiratory dysfunction following surgery, including atelectasis, secretion retention, loss of lung volumes, infection and pain. Explain which areas of cardiothoracic dysfunction following surgery would be responsive to physiotherapy interventions 		<ul style="list-style-type: none"> Scholar: 1.1, 1.2 	<p>Formal learning – Participation of a learner on a skills-based course on physiotherapy in surgery</p> <p>Watch videos and observation of clinical demonstration on how to assess an adult post-operative patient and decide on risk status of patients</p> <p>Review systematic respiratory assessment and treatment skills from modules 1-3</p> <p>Review chest radiograph interpretation skills</p>	<p>MCQ</p> <p>Case based examination</p>	2	
2. Assessment and monitoring of patient status, risk factors and stratification	<ul style="list-style-type: none"> Identify and consider risk factors such as smoking, obesity, decreased lung function, decreased functional performance, respiratory muscle force, and cough ability Describe patient's stratification of risk Describe a logical, systematic approach for assessing physical and respiratory dysfunction in patients before and after abdominal or thoracic surgery Identify a prioritised list of clinical problems and establish a measurable baseline for evaluating response to physiotherapy interventions Recognise signs of respiratory dysfunction in pre/post-surgery Specify management plan 	<ul style="list-style-type: none"> Perform regular patient assessment including ability to cough, ability to breathe deeply, respiratory muscle force to detect respiratory dysfunction and complications in patients submitted to thoracic and abdominal surgery Interpret results of patient assessment and document the findings Complete documentation procedure 		<p>Formal learning – Participation of a learner on a skills-based course on physiotherapy in surgery</p> <p>Work based learning - Assess an adult post-operative patient and decide on the status of patients and have a clear management plan</p>	<p>DOPS</p> <p>Case based examination</p> <p>Mini-CEX</p> <p>Simulation</p> <p>Multi source feedback</p> <p>Portfolio</p>	4	Assessment of at least 5 patients under supervision and when competency is demonstrated, a minimum of 5 patients assessed alone
3. Therapeutic options for the pre-operative period	<ul style="list-style-type: none"> Describe findings of the preoperative assessment Identify pre-operative therapeutic priorities Discuss indications and contra-indications of techniques for patients under high risk or low risk Compare and critically contrast various physiotherapy techniques and review objectives, rationale and limitations of each technique Describe the risk - benefit ratio of each technique according to the patient's status Recall indications for pre-operative exercise training as a part of multidisciplinary pulmonary rehabilitation such as lung transplantation and 	<ul style="list-style-type: none"> Based on a patient assessment, select techniques for each patient such as breathing techniques, ACT, coughing, RMT, and exercise training Execute the chosen techniques Assess patient's suitability to undergo each technique in terms of indications, applicability, level of cooperation, hemodynamic stability and, level of oxygenation Assess response to each technique Adjust therapeutic plan according to patient responses Document adequately the chosen methods and techniques and patient responses related to the 		<p>Formal learning – Participation of a learner on a skills-based course on physiotherapy in surgery</p> <p>Work based learning -Assess an adult pre-operative patient and decide on the status of patients and have a clear management</p>	<p>DOPS</p> <p>Case based examination</p> <p>Mini-CEX</p> <p>Simulation</p> <p>Multi source feedback</p> <p>Portfolio</p>	4	Assess a minimum of 10 preoperative patients Manage minimum of 10 preoperative patients

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	lung volume reduction surgery <ul style="list-style-type: none"> Describe findings of supervised and unsupervised exercises/training effectiveness before the planned surgery interventions Discuss the role of interdisciplinary pulmonary rehabilitation in thoracic and abdominal surgery Specify management plan 	treatment <ul style="list-style-type: none"> Apply pre-operative supervised exercise training as a part of multidisciplinary pulmonary rehabilitation Complete documentation procedure 		plan			
4. Therapeutic options for the post-operative period	<ul style="list-style-type: none"> Describe findings of the post-operative assessment Identify post-operative therapeutic priorities Discuss indications and contra-indications of techniques for patients with post-operative complications Compare and contrast various physiotherapy techniques and review limitations of each technique Recall indications for post-operative exercise training as a part of multidisciplinary pulmonary rehabilitation such as lung transplantation and lung volume reduction surgery Define the risk - benefit ratio for each technique according to the patient's status Specify management plan 	<ul style="list-style-type: none"> Based on a patient assessment, select techniques for each patient such as breathing techniques, ACT, coughing, RMT, and exercise training Execute the chosen techniques Assess patient's suitability to undergo each technique in terms of indications, applicability, level of cooperation, hemodynamic stability and, level of oxygenation Assess response to each technique Adjust therapeutic plan according to patient responses Document adequately the chosen techniques and patient responses related to the treatment Apply post-operative exercise training as a part of multidisciplinary pulmonary rehabilitation 		Formal learning – Participation of a learner on a skills-based course on physiotherapy in surgery	DOPS Case based examination Mini-CEX Simulation Multi source feedback Portfolio	4	Assess a minimum of 10 postoperative patients Manage minimum of 10 post-operative patients
5. Summarising the evidence and reference to evidence-based documents	<ul style="list-style-type: none"> Describe the principles of critical appraisal Evaluate level of evidence according to widely accepted tools for quality assessment Assemble the available evidence Access, interpret and examine the relevant scientific evidence and evidence-based guidelines Conduct systematic search for evidence Conduct critical literature appraisal 	<ul style="list-style-type: none"> Contribute to enhance quality of care and patient safety in practice, integrating the best available evidence and best practice Apply evidence into clinical practice 	<ul style="list-style-type: none"> Scholar: 1.1, 1.2, 3.1, 3.3, 3.4 	Self-directed learning: case based discussion (face to face) and in online environment Literature review Appraisal of a scientific article related to clinical work	MCQ Case based assessment	2	Perform at least one literature review related to a concrete clinical case

Module 6 Pharmacotherapy relevant to the physiotherapist

Mandatory

Module Competency
To explain the rationale and effects of pharmacotherapy and monitor response and use of pharmacotherapy relevant to physiotherapy

CanMEDS Roles
In this module the following CanMEDS roles are identified: the Expert, Communicator, Collaborator, Professional, Health advocate, and Scholar.

Specifically for 'Attitudes' the following roles are identified: Communicator (item 3.1), Collaborator (item 1.3), and health advocate (items 1.2-1.3). Other attitudes specifically relevant for certain subitems within this module are listed below.



Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
1. Supplemental O ₂ therapy in different situations	<ul style="list-style-type: none"> Explain and discuss the physiology of gas exchange, transport and O₂ utilisation Explain and discuss the rationale and clinical significance of using supplementary O₂ therapy for acute and chronic hypoxaemia Summarise the benefits and risks of O₂ therapy Following the guidelines, define supplemental O₂ therapy for acute and chronic hypoxaemia According to guidelines, identify criteria to supplemental O₂ therapy based on patient condition Explain how to select titration for acute, long-term and ambulatory O₂ therapy Describe different delivery systems and sources for O₂ therapy Describe the safety regulations for storing and using O₂ Monitor and review results of patient assessment to identify patients who may benefit from supplemental O₂ therapy Present current evidence for use of supplementary O₂ therapy in different situations 	<ul style="list-style-type: none"> Titrate O₂ therapy for acute, chronic and exercise induced hypoxaemia during physiotherapy treatment, exercise and mobilisation Monitor and document patient response to supplemental O₂ by reviewing O₂ level during and after physiotherapy treatment, exercise and mobilisation According to local guidelines, assess the risks of supplement O₂ therapy for example excessive oxygenation, hypercapnia, fire risks 	<p>Module specific attitudes:</p> <ul style="list-style-type: none"> Being able to explain in patient language and taking into account local legislation the correct use of O₂ therapy 	<p><i>Umbrella for all syllabus items</i></p> <p>Self-directed learning: literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed</p> <p>Formal learning: (ERS school courses or equivalent)</p> <p>Learning with other professionals: participate in case-based discussions</p>	<p>MCQ</p> <p>Portfolio</p> <p>Clinical log book</p> <p>DOPS</p>	3	<p>Explain diagnosis, treatment and management to 20 patients</p> <p>Discuss 20 patients in a case based discussion</p>
2. Aerosoltherapy	<ul style="list-style-type: none"> Explain different groups of inhaled medication and discuss indications for using them such as bronchodilators, muco-active drugs, steroids Summarise the benefits and side effects of inhaled drugs Discuss types of devices used for aerosol therapy for example nebulisers, metered dose inhalers, dry powder inhalers Describe indications to use aerosol therapy as an adjunct to physiotherapy intervention for example to improve exercise performance Monitor and review results of patient assessment to identify patients who may benefit from aerosol therapy 	<ul style="list-style-type: none"> Monitor patient response to aerosol therapy and effects on physiotherapy treatment Instruct patients to use aerosol therapy in preparation for physiotherapy intervention Present current evidence for use of aerosol therapy in relation to physiotherapy management 			<p>MCQ</p> <p>Portfolio</p> <p>Clinical log book</p> <p>DOPS</p>	3	<p>Explain diagnosis, treatment and management to 20 patients</p> <p>Discuss 20 patents in a case based discussion</p>
3. Influence of cardiorespiratory medication on physiotherapy treatment and rehabilitation	<ul style="list-style-type: none"> Summarise types of cardiorespiratory medication, their benefits and side effects relevant to physiotherapy such as reduced blood pressure or tachycardia Recognise impact of cardiorespiratory medication on physiotherapy treatment such as exercise performance Discuss patient's response to cardiorespiratory medication Recognise conditions which require cardiorespiratory medication Describe physiology and pathophysiology in relation to cardiorespiratory medication and its impact on physiotherapy treatment 	<ul style="list-style-type: none"> Monitor and review patient's response to cardiorespiratory medication in response to exercise Report on patient's condition in relation to cardiorespiratory medication needs 			<p>MCQ</p> <p>Portfolio</p> <p>Clinical log book</p>	2	<p>Explain diagnosis, treatment and management to 20 patients</p> <p>Discuss 20 patents in a case based discussion</p>
4. Effects of anaesthesia and analgesia on physiotherapy	<ul style="list-style-type: none"> Recall types of anaesthesia Discuss influence of anaesthesia on cardiovascular, respiratory, central and peripheral nervous systems 	<ul style="list-style-type: none"> Assess cough and ventilation effectiveness in response to anaesthesia Monitor impact of anaesthesia on cardiovascular function, cough reflex and lung volumes 	<ul style="list-style-type: none"> Collaborator: 3.1 Module specific attitudes: Consider patient's feedback and subjective experience when considering 		<p>MCQ</p> <p>Portfolio</p> <p>Clinical log book</p>	2	<p>Explain diagnosis, treatment and management to 20 patients</p> <p>Discuss 20 patents in a</p>

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
treatment and rehabilitation	<ul style="list-style-type: none"> Recognise the side effects of anaesthesia on cardiovascular system, cough reflex or hypoventilation. Discuss the impact and benefits of anaesthesia for physiotherapy and rehabilitation 	<ul style="list-style-type: none"> Monitor and analyse patient's response to anaesthesia with objective assessments for vital signs and patient's subjective perception. Co-ordinate use of analgesia with physiotherapy intervention, e.g. pain management to improve patient's cooperation. 	anaesthesia e.g. pain management procedures				case based

Module 7 Non-invasive ventilation for the respiratory physiotherapist

Mandatory (Note: The use of NIV in airway clearance is discussed in Module 2 "Techniques for Airway Clearance in Adult patients". The use of NIV in pulmonary rehabilitation is covered in module 4 "Exercise Training and Physical Activity".)

Module Competency	To explain the rationale and to apply appropriately the use of non-invasive ventilation (NIV) in the respiratory patient.						
CanMEDS Roles	<p>In this module the following CanMEDS roles are identified: the Expert, Communicator, Collaborator, Professional, Leader, and Scholar.</p> <p><i>Specifically for 'Attitudes' the following roles are identified: Communicator (item 3.1 and all items under point 5), Collaborator (item 1.3), and leader (items 1.2-1.3). Other attitudes specifically relevant for certain subitems within this module are listed below.</i></p>						
<p>1. Definition of modalities and parameters, difference between acute ventilatory support (NIV and CPAP) and long-term ventilator support, limitations (effects and risks), indications and contraindications of NIV</p> <p><i>(For the purpose of this module ventilatory support relates to both NIV and CPAP)</i></p>	<ul style="list-style-type: none"> Describe continuous positive airway pressure (CPAP) and NIV Review indications and application of ventilator support therapy according to the current guidelines in the field. Summarise the mechanism of action for ventilator support and discuss physiological effects of ventilator support to the patient with regard to arterial blood gases (ABG), work of breathing, breathlessness and comfort Discuss the benefits and pitfalls of using non-invasive support versus invasive support Explain the indications for the provision of ventilator support in the acute and chronic setting with regard to chronic obstructive pulmonary disease (COPD), NMD, chest wall deformity, cardiogenic pulmonary oedema and hypoxic respiratory failure. Identify the palliative role of the use of ventilator support Discuss the differences and indications for CPAP, bi-level pressure, adaptive support ventilation and pressure support, volume assured pressure support (VAPS) or/and volume support Define parameter settings (such as expiratory and inspiratory positive airway pressure, respiratory rate) Define the modes of ventilation (Spontaneous, timed, spontaneous timed, CPAP and VAPS) Define alarm parameter settings such as high pressure alarm, low pressure alarm, high flow, low flow, disconnect 	<ul style="list-style-type: none"> Identify the correct environment for initiating NIV depending on <ul style="list-style-type: none"> indication for NIV (prophylactic, acute, chronic, palliative) level of dependency availability of adequate monitoring availability of correct skill mix Identify when to withdraw NIV treatment Recognise when the patient requires invasive ventilation and refer appropriately Develop the psychomotor skills necessary to correctly apply the treatment Organize and co-ordinate patient sessions, taking into consideration workload, clinical priorities; other priorities (medical doctors' visits and exams; nursing priorities, meal times), efficient use of available resources 	<ul style="list-style-type: none"> Scholar: 1.1, 1.2 Organize and co-ordinate patient sessions taking into consideration: <ul style="list-style-type: none"> workload clinical priorities other priorities (doctors' visits and exams, nursing priorities, meal times) the good use of available resources 	<p><i>Umbrella for all syllabus items</i></p> <p>Self-directed learning (NIV simulation, literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed)</p> <p>Formal learning (ERS school NIV courses or equivalent to update both knowledge and skills)</p> <p>Learning with other professionals: participate in case-based discussions</p>	<p><i>Umbrella for all syllabus items</i></p> <p>MCQ (Knowledge based items)</p> <p>NIV simulator (skill based assessment)</p> <p>Portfolio (Knowledge and skill based)</p> <p>discussion of a variety of different clinical cases</p> <p>DOPS</p>	<p><i>Umbrella for all syllabus items</i></p> <p>3</p>	<p><i>Umbrella for all syllabus items</i></p> <p>Elaborate management plan and carry out treatments under supervision for a minimum of 10 patients of (half of them acute) and when competency is demonstrated, manage another 10 unsupervised.</p>

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	<ul style="list-style-type: none"> Summarise the absolute contra indications and relative contraindications for the use of ventilatory support Outline the factors predictive of failure of non-invasive ventilator support with regards to arterial blood gas tension, respiratory rate, breathlessness and hemodynamic stability Critique possibilities and limitations of treatment modalities with respect to the patient's comorbidities Review the evidence base for the use of ventilator support in the acute and chronic setting dependent on the patient's pathology 						
2 a. Devices	<ul style="list-style-type: none"> Describe types of positive pressure airway therapy and different modes: e.g. CPAP, auto titrating CPAP, bi-level positive airway pressure (BPAP) ventilation, and other NIV modes (high flow oxygen (HFO)) Compare the mechanism of action of different modes of positive pressure therapy in respect to different machines Illustrate how to match positive pressure mode to patient's pathophysiology e.g. CPAP for obstructive sleep apnoea, bi-level for obesity hypoventilation syndrome OR NMD with hypercapnia, HFO for pneumonia and interstitial lung-disease Differentiate between which ventilators and settings will deliver a higher concentration of O₂ if required Summarise the evidence base for the use of "high intensity" versus "low intensity" NIV in patients with COPD Discuss ventilation strategies in patients with obesity hypoventilation syndrome Discuss which ventilators are more appropriate to use in the acute setting compared to the long-term setting Review research evidence on NIV ventilators Discuss ventilator maintenance (filter changes) 	<ul style="list-style-type: none"> Explain therapy to the patient <ul style="list-style-type: none"> Choose most appropriate machine Demonstrate correct set up of the chosen equipment Initiate treatment and adjust settings to patient's pathology and co-morbidities and ABG Evaluate patient tolerance of ventilator support and adjust settings as appropriate Ensure treatment objectives are achieved in terms of patient clinical evolution (e.g. improved blood gases, reduced respiratory rate, better lung volumes normalized nocturnal oximetry, transcutaneous CO₂, cardiorespiratory monitoring, abolished respiratory events etc.) Identify when the device or mode of ventilation needs to be changed and do so appropriately Teach patient and family how to manage the CPAP or ventilator for self-management in the long-term setting Ensure ventilator maintenance is respected 					
2 b. Monitoring equipment	<ul style="list-style-type: none"> Describe the use of oximetry and CO₂ (capnography and transcutaneous) monitoring in acute and chronic ventilator support Review pros and cons of oximetry and CO₂ monitoring in acute and chronic ventilator support Discuss advantages and disadvantages of different systems available Review research evidence on monitoring equipment 	<ul style="list-style-type: none"> Interpret oximetry and CO₂ monitoring Conduct "titration" to achieve appropriate settings for the patient Respect recommended hygiene measures Interpret night-time oximetry, capnography results and cardio respiratory monitoring to titrate positive airway pressure Detect asynchronies and residual respiratory events by observing the patient. Interpret data from built-in software of home ventilators 					
2 c. Interfaces	<ul style="list-style-type: none"> List different types of positive pressure interfaces including nasal masks, facemasks, nasal plugs, total facemasks helmets and mouth pieces and how these may suit different patients 	<ul style="list-style-type: none"> Evaluate and apply the indications for the chosen interface Adjust interface to patient's pathology and co-morbidities 					

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	<ul style="list-style-type: none"> Explain why certain masks are more likely to be used in the acute set up as compared to long-term set up of ventilator support Differentiate between “vented” and “non-vented” masks Classify the benefits and potential side effects of each type of interface Define the current options available to prevent or manage interface pressure sores Review research evidence on available interfaces Be aware of recommended hygiene measures 	<ul style="list-style-type: none"> Adapt parameters to type of interface (use of total face or helmet) Evaluates patient tolerance of the interface Where indicated teach patient and family positioning of the interface for self-management Demonstrate options for pressure sore management with regard to the interface of choice Identify when the mask needs to be changed and do so appropriately Apply hygiene measures in accordance with protocol in place 					
2 d. Circuits	<ul style="list-style-type: none"> List different types of circuit (double limb, single limb, leak and active valve) and how these may suit different patients Explain why certain circuits are more likely to be used in the acute set up compared to long-term set up of ventilator support and also the types of circuit that are more likely to be used when transferring patients from invasive to non-invasive support Discuss the benefits and pitfalls of each type of circuit Identify the best position in the circuit for the entrainment of O₂ therapy when you need to give a high concentration of O₂ and a low concentration of O₂ Compare different positions within the circuit to deliver aerosol therapy Review research evidence on available NIV circuits 	<ul style="list-style-type: none"> Evaluate and apply the indications for the chosen circuit Adjust circuit to patient’s pathology and co-morbidities Evaluate patient tolerance of the circuit Identify when the circuit needs to be changed and do so appropriately Appropriately evaluate and apply the addition of O₂ therapy to the circuit. Appropriately apply and evaluate the addition of aerosol therapy within the circuit Teach patient and family how to attach the circuit for self-management Respect recommended hygiene measures 					
2 e. Humidification	<ul style="list-style-type: none"> Explain the rationale for/importance of optimal humidification during NIV Distinguish between the different humidification (heat moisture exchangers (HME), cold water pass over, heated pass over humidification, counter flow heated humidification and internal and external systems) and how these may suit different patients Explain why certain types of humidification are more likely to be used in the acute set up compared to long-term set up of ventilator support Classify the benefits and potential side effects of each type of humidification Be aware of hygiene protocols in place Review research evidence on humidification systems 	<ul style="list-style-type: none"> Apply and evaluate the indications for the chosen humidification Adjust humidification if required to patient’s pathology and co-morbidities Teach patient and family how to manage the humidification for self-management in the long-term setting Evaluates patient tolerance of humidification Demonstrate correct set up of the chosen humidification system Identifies when the humidification system needs to be changed appropriately Respect recommended hygiene measures 					
2 f. Compliance	<ul style="list-style-type: none"> Recognise the concepts of compliance and adherence Assessment of compliance and reasons for poor and good compliance 	<ul style="list-style-type: none"> Apply problem solving strategies for patients with compliance problems Identify cause of patients’ lack of compliance (airway dryness, mask intolerance) 	<ul style="list-style-type: none"> Communicator: 4.3 				
2 g. Algorithms	<ul style="list-style-type: none"> Describe treatment algorithms in the management of an acute exacerbation on hypercapnic respiratory failure using COPD as an example 	<ul style="list-style-type: none"> Apply suitable algorithms Choose patients who can benefit from optimising treatment Correctly identify cases which could benefit from 					

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
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		treatment optimization /individualization					
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Module 8 Physiotherapy related to deconditioning and prevention of complications in the intensive care units

Optional (Note: Focused on the critically ill patient treated within the ICU and related areas high dependency or intermediate units)

Module Competency	To explain, select and apply therapeutic options, based on assessment. To evaluate the effects and risks of physiotherapy on the severely ill patient. To identify limitations of treatment and react to patient's clinical status.
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CanMEDS Roles	In this module the following CanMEDS roles are identified: the Expert, Communicator, Collaborator, Professional, and Scholar. <i>Specifically for 'Attitudes' the following roles are identified: Communicator (item 3.1), Collaborator (item 1.3), and Professional (items 1.3+3.1). Other attitudes specifically relevant for certain subitems within this module are listed below.</i>
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1. Rationale indications, and design of treatment plan for the critically ill patient	<ul style="list-style-type: none"> Discuss the pathophysiology of deconditioning related to the critically ill Explain the effects of sedation, mechanical ventilation and bed rest on cardiovascular and pulmonary function, endocrinology, respiratory and peripheral muscle function and patient's psychological status Discuss the rationale behind the use of physiotherapy and early mobilisation for prevention and treatment of adverse effects related to intensive care Review indications and contraindications of therapy according to the current guidelines in the field and local protocols Design a therapeutic plan choosing appropriate approach and techniques Develop a treatment plan 	<ul style="list-style-type: none"> Perform patient assessment in collaboration with the MDT to identify if patient is suitable for early mobilisation Adapt treatment in accordance to clinical status, patient's pathology and local protocols in place Ensure adequate precautions are in place to allow safe treatment including secure arterial and venous lines, check airway ties, adapt ventilation, adequate staffing and pain medication administered in advance React to adverse haemodynamic changes and redesign treatment plan based on this evaluation Organize and co-ordinate patient sessions taking into consideration workload, clinical priorities; other priorities (medical doctors' visits and exams; nursing priorities, meal times), efficient use of available resources 	<ul style="list-style-type: none"> Scholar: 1.1, 1.2 <p>Module specific attitudes:</p> <ul style="list-style-type: none"> Encourage the patient in his endeavours during the mobilisation sessions. 	<p><i>Umbrella for all syllabus items</i></p> <p>Literature review: Assemblage of documentation pertaining to mobilisation in acute care.</p> <p>Formal learning: Theoretical workshops</p> <p>Work based learning: Performing procedures with patients Practical workshops Case studies</p>	<p><i>Umbrella for all syllabus items</i></p> <p>Clinical evaluation</p> <p>DOPS</p> <p>Case based discussion</p> <p>Portfolio</p>	4	<p><i>Umbrella for all syllabus items</i></p> <p>Assess and manage a minimum of 20 patients</p>
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2. Monitoring during treatment	<ul style="list-style-type: none"> Review the different monitoring commonly used in ICU, including: electrocardiogram (ECG), Swann Ganz, arterial lines, O₂-CO₂ monitoring, intracranial pressure) According to guidelines, review the normal values for the different parameters monitored and recognise abnormalities Discuss the perceived obstacles to mobilisation caused by the different monitoring including ECG, Swann Ganz, arterial lines, O₂-CO₂ monitoring, and intracranial pressure Discuss with the attending medical doctor the setting of upper and lower limits for the alarms in relation to different pathologies and the aim of the treatment Recall patient safety measures including 	<ul style="list-style-type: none"> Recognize signs of ineffective pain relief Monitor patient during treatment to detect signs of non-tolerance including patient distress – grimace, agitation, increased blood pressure, heart rate, diminished O₂ saturation, ventilators dysynchrony Adapt treatment in response to different parameters monitored Adjust settings of upper and lower limits of the alarms based on patient's condition, aim of the treatment and local protocols in place Adapt to any extreme adverse situations encountered such as pneumothorax, accidental extubation, catheter removal, and cardiac arrest by calling attending medical staff and initiating mask ventilation or basic life support (BLS) etc. Record patient's progression and adapt use of 	<ul style="list-style-type: none"> Professional: 2.2 <p>Module specific attitudes:</p> <ul style="list-style-type: none"> Ensure patients safety at all times by applying adequate precautions to vital equipment (secure the endotracheal tube, drains, perfusions) 	<p>Assemblage of documentation pertaining to mobilisation in acute care.</p> <p>Suggested scientific literature</p> <p>Formal learning (required to gain knowledge of different monitoring systems).</p>	<p>Clinical evaluation</p> <p>Case based examination</p> <p>Portfolio</p> <p>DOPS</p>		
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Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	equipment for assessment and treatment	techniques and equipment accordingly <ul style="list-style-type: none"> Recognise signs that patient medication is inadequate such as agitation, desaturation and inform other members of the MDT as appropriate' 		Work based learning to acquire skill in applying knowledge to dose treatment) Case studies			
3. Body Positioning	<ul style="list-style-type: none"> Discuss the effects of patient positioning (Supine head 45°, side lying, sitting, prone) on: respiratory aspects, hemodynamic aspects, musculoskeletal aspects, proprioception, skin Evaluate potential risks involved in position changing including accidental catheter removal, removal endotracheal tube, positioning non tolerated blood pressure, heart rate, oxygenation, patient comfort, agitation Identify the potential risks in relation to physiotherapy including accidental removal of catheters, airway, cardiac, hemodynamic and/or respiratory instability 	<ul style="list-style-type: none"> Perform patient assessment to identify patient suitability for different body positions. Adapt positioning to: <ul style="list-style-type: none"> Patient's pathology such as post-surgical, spinal fractures, head injury, pneumonia Clinical status such as agitation, blood pressure, heart rate and rhythm, Equipment including catheters, extracorporeal membrane oxygenation (ECMO), hemodiafiltration Taking into account pharmacological aspects and following any protocols or clinical pathways in use. Use rotational techniques (protocol) to place patient in prone position Take measures to ensure patient's comfort and safety (secure airway, catheters, adequate pain medication, sufficient staffing) Recognise clinical signs of non-tolerance, continue to monitor patient's reaction and adapt ventilator settings and/or modify position respecting unit guidelines 	Module specific attitudes: <ul style="list-style-type: none"> Prepare the family for eventual side effects of prone positioning (facial oedema) 	Assemblage of documentation pertaining to mobilisation in acute care. Work based learning Case studies	DOPS Case based examination Portfolio		Participate in the positioning of a minimum of 20 patients
4. Rehabilitation including mobilisation, exercise, neuromuscular electrical stimulation, inspiratory muscle training	<ul style="list-style-type: none"> Recall physiology of normal muscle activity (module 4) Discuss the effects of immobility on muscle function Outline the neurological and psychological effects of immobility / Physiological basis of muscle dysfunction in critical illness Explain the rationale behind the use of exercise therapy <ul style="list-style-type: none"> passive, active-assisted, active, resistive Neuromuscular electrical stimulation Inspiratory muscle training Cycle-ergometer/ other rehabilitation appliances Discuss the psychological and social effects of exercise Review indications and contraindications of different therapies according to current guidelines in the field 	<ul style="list-style-type: none"> Identify the benefits and risks of rehabilitation for individual patients on the ICU Design a treatment programme based on a patient evaluation Apply efficiently the treatment Adapt the therapy to patient's tolerance, safety, progress and clinical condition Use mechanical and electronic devices including Motorized Cycling, for peripheral muscle training Ensure adequate precautions are taken into account Asses treatment efficacy Record treatment and provide information to allow patient to make informed decision on value of treatment options Respect recommended hygiene measures 	Module specific attitudes: <ul style="list-style-type: none"> Encourage the patient in his efforts during in the rehabilitation process Organize and co-ordinate patient sessions taking into consideration workload, clinical priorities; other priorities (medical doctors' visits and exams; nursing priorities, meal times) Collaborate with nursing staff to plan the timing of treatments (examinations, administration of sedation, pain relief etc.) In collaboration with nursing staff establish methods of communication (such as eye/head movements, picture chart, written form, computer, phonation tube, etc.) Involve patients and family in aspects of care in which they can participate 	Assemblage of documentation pertaining to mobilisation in acute care. Work based experience Practical workshops Case studies	Clinical evaluation Case based examination Portfolio		Assess and manage a minimum of 10 patients under supervision and when competency is demonstrated another 10 without supervision. (to cover the module)
5. Contra-indications and risks	<ul style="list-style-type: none"> Describe the contraindications for early rehabilitation Identify the potential risks Identify the consignes related to contraindications/relative contraindications Identify the guidelines in place, the equipment and actions required in an "emergency situation" such as accidental tube removal, 	<ul style="list-style-type: none"> Demonstrate respect of the consignes related to contraindications /relative contraindications Adapt the treatment programme to suit the clinical situation and patient's capabilities Detect and avert potential risks Demonstrate the ability to react to an emergency situation Demonstrate familiarity with the equipment required 		Assemblage of documentation pertaining to mobilisation in acute care. Formal learning	Clinical evaluation Case based examination Portfolio		

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	catheter removal, cardiac arrest, ventilator disconnection	in an emergency		Case studies			
6. Summarising the evidence and reference to evidence-based documents	<ul style="list-style-type: none"> Refer to evidence-based articles for the different aspects of mobilisation in acute care Describe the principles of critical appraisal Evaluate level of evidence according to widely accepted tools for quality assessment Assemble the available evidence Access, interpret and examine the relevant scientific evidence and evidence-based guidelines Conduct systematic search for evidence Conduct critical literature appraisal 	<ul style="list-style-type: none"> Apply recommendations from evidence-based publications to patient care 	<ul style="list-style-type: none"> Scholar: 1.1, 1.2, 3.1, 3.3, 3.4 	Case based discussion	Clinical evaluation Case based discussion MCQ	2	Perform at least one literature review related to a concrete clinical case

Module 9 Mechanical Ventilation for the Respiratory Physiotherapist

Optional

Module Competency	To explain the rationale and apply the characteristics, effects and monitoring of invasive mechanical ventilation and apply such therapy when permitted by regional legislation.						
CanMEDS Roles	 <p><i>In this module the following CanMEDS roles are identified: the Expert, Communicator, Collaborator, Professional, and Scholar.</i></p>						
1. Criteria for intubation, extubation and weaning process	<ul style="list-style-type: none"> Review the criteria for intubation Explain different strategies for avoiding invasive mechanical ventilation Summarise the procedures for intubation according to local guidelines Explain the precautions in place to ensure patient safety According to hospital protocol, discuss the criteria for successful weaning such as conscious state, haemodynamic stability, intact swallowing mechanism*) in relation to different pathologies. * Discuss the importance of the swallowing reflex in relation to successful extubation and, where required, assure further evaluation and treatment by a qualified health professional Compare and contrast various strategies used to wean patients from ventilator support Discuss different approaches to establishing patient's readiness for extubation (CPAP, T-tube, BPAP) Discuss the importance of the swallowing reflex in relation to successful extubation Explain extubation procedures 	<ul style="list-style-type: none"> Recognize signs of respiratory failure requiring mechanical ventilation and notify medical staff immediately Apply where appropriate strategies to avoid the necessity for invasive mechanical ventilation (NIV, HFO) Closely monitor the situation, recognize when these strategies are not effective and notify medical staff immediately to prevent risks associated with delaying intubation Ensure precautions to ensure patient safety are in place (check equipment; pre-oxygenation) According to hospital protocol/guidelines, design an individual weaning regime in collaboration with medical and nursing staff Apply strategies to wean patients from ventilator support based on local protocol Apply strategies to wean patients from tracheostomy if local regulations permit Apply strategies to wean patients from mechanical ventilation via endotracheal tube or tracheostomy in accordance with local protocol Apply strategies to wean patients from tracheostomy 	<p>Module specific attitudes:</p> <ul style="list-style-type: none"> Ensure communication is maintained even if patient is non-reactive (induced coma/coma) Address patients' fears and anxieties in respect of the intensive care situation 	<p>Formal learning</p> <p>e.g. Participation at a skills-based course on monitoring of invasive mechanical ventilation</p> <p>E-Learning</p> <p>Practical workshops</p> <p>Experience modes of ventilation through mask ventilation</p> <p>Work-based learning</p> <p>Performing procedures with patients</p> <p>Review of literature</p> <p>Case conferences</p>	MCQ Portfolio (overall for module – to be reviewed) DOPS		Manage a minimum of 10 patients (with different pathologies, either intubated or tracheotomised) on mechanical ventilation under supervision and when competency is demonstrated another 10 without supervision (to cover the module)

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	<ul style="list-style-type: none"> Discuss the appropriate post-extubation care taking into account clinical aspects and local hospital protocol. Discuss management problems for difficult to wean patients 	<ul style="list-style-type: none"> Perform a spontaneous breathing trial (CPAP or T-tube) Evaluate a patient's readiness for extubation (based on patient's clinical parameters (respiratory rate, vital capacity, rapid shallow breathing index results swallowing reflex*), Extubate the patient respecting the hospital protocol Identify/ anticipate potential risks for a mechanically ventilated patient in ICU Recognise signs of post extubation respiratory failure and take appropriate action Apply and adapt treatment to clinical evaluation Swallowing should also be covered 					
2. Hemodynamic effects of mechanical ventilation	<ul style="list-style-type: none"> Recall basic cardiorespiratory physiology Describe the hemodynamic effects of mechanical ventilation Identify potential consequences and risks especially pertaining to physiotherapy management Identify and recall effects of drugs specific to intensive care such as cardiovascular drugs (vasopressors and vasodilators etc.), sedatives, analgesics, muscle relaxants 	<ul style="list-style-type: none"> Recognize consequences of mechanical ventilation on hemodynamics Elaborate physiotherapy treatment plan with attending physician in the event of haemodynamic instability Adapt or delay treatment in consequence to patient's clinical status (modification of sedatives, cardiovascular drugs or analgesics to ensure patient's comfort) Ensure patient safety 		<p>Self-directed learning (literature search with appraisal of a scientific article related to the clinical presentation of a patient currently being managed, complete documentation procedure related to physiotherapy treatment, practical application)</p>	<ul style="list-style-type: none"> Oral examination Case based discussion Mini-CEX Simulation DOPS Portfolio 	<p>Assess and manage a minimum of 10 patients with a range of pathologies and depending on the local availability of the different pathologies (COPD, ARDS, post-operative, neurological) under supervision and when competency is demonstrated another 10 assessed and managed alone</p>	
3. Monitoring	<ul style="list-style-type: none"> Describe various monitoring and assessment methods (O₂ saturation; ECG, heart rate, respiratory rate, blood pressure, CO₂, level of consciousness) used to evaluate patients receiving mechanical ventilation Discuss how to regulate alarm settings Recall normal values for key variables in monitoring body systems and explain the implications of monitoring on physiotherapy treatment 	<ul style="list-style-type: none"> Continually observe patient monitoring during treatment to detect signs of non-tolerance (grimace, agitation, increased blood pressure, heart rate, ventilator dysynchrony etc.) React to modifications in clinical values (O₂ saturation, heart rate, blood pressure, pain) Inform attending physician if values go beyond accepted limits Adapt alarm setting according to local protocol Adapt treatment, e.g., increase fraction of inspired O₂; adjust ventilator parameters, adapt sedation and or analgesia) In the event of extreme adverse effects stop treatment inform medical staff and apply appropriate action (cardiac arrest->BLS); accidental extubation->mask ventilation) Complete and document the monitoring in relation to physiotherapy treatment 	<p>Module specific attitudes:</p> <ul style="list-style-type: none"> Communicate to patients any detectable parameter changes that might create discomfort, fear or resistance 	<p>Formal learning (participation in a skills-based course, workshops with practical application)</p> <p>Learning with other professionals: participate in case-based discussions</p> <p>Complete documentation procedure related to physiotherapy treatment</p>	<ul style="list-style-type: none"> Oral examination Case based discussion Mini-CEX Simulation DOPS Portfolio 		
4. Management of artificial airways (tube, tracheostomy)	<ul style="list-style-type: none"> Summarise the characteristics of the different endotracheal and tracheostomy tubes available and give the indications for use Describe care and surveillance necessary for artificial airways Appreciate the importance of hygiene for infection control and respect the guidelines in place 	<ul style="list-style-type: none"> Perform necessary controls such as positioning of tube, cuff pressure, tube patency; tube fixation, mouth care, airway clearance Manipulate different tubes in collaboration with the nursing staff (endotracheal tube repositioning to prevent sores; management of tracheostomy tubes - with/without cuff, fenestrated/non fenestrated) 		<p>Complete documentation procedure related to physiotherapy treatment</p> <p>Practical application</p>	<ul style="list-style-type: none"> Oral examination Case based discussion Mini-CEX 		

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
		<ul style="list-style-type: none"> • Ensure patient safety and comfort during treatment (secure arterial and venous lines, check airway ties adapt pain medication and/or sedation etc.) • Adjust physiotherapy management in terms of artificial airways (e.g. open and closed suction, positioning, etc.) • Document physiotherapy treatment plan • Organize and co-ordinate patient sessions taking into consideration workload, clinical priorities; other priorities (medical doctors' visits and exams; nursing priorities, meal times), efficient use of available resources 			Simulation DOPS Portfolio		
5. The basics of mechanical ventilation: Modalities and parameters in different conditions	<ul style="list-style-type: none"> • Describe functional characteristics of ventilators and the relationship of controls and alarm systems to their function • Define different ventilator modes (conventional, unconventional including ECMO and high frequency) • Explain the use of different parameters in respect to various pathologies • Describe initial ventilator settings • Describe effects and complications of mechanical ventilation (such as cardio-respiratory-neuromuscular complications - mucociliary clearance, ventilator associated pneumonia, loss of lung volume, respiratory muscle weakness etc. • Explain the contribution of pre-morbid risk factors (obesity, COPD, Diabetes. Heart failure in exacerbating complications associated with mechanical ventilation • Recall the range of physiotherapy techniques available to manage clinical problems encountered, such as endotracheal and airway suction, lung recruitment techniques, body positioning • List different gases that may be used for ventilation (e.g., Hélio_x, nitric oxide) • Recall indications and contraindications of various gases 	<ul style="list-style-type: none"> • Apply initial ventilator setting according to medical prescription • Adapt different settings of ventilator according to patients' individual needs to reach ventilatory targets • Identify a prioritized list of clinical problems and establish a treatment programme • Adapt physiotherapy treatments with respect to patient's pathology (acute respiratory distress syndrome, Asthma, COPD, post-operative) and specific ventilator settings (e.g., protective ventilation, positive end expiratory pressure (PEEP) dependency) • Adapt physiotherapy for airway clearance in respect of ventilator settings, presence of multiresistant infection (e.g. patient in respiratory isolation for tuberculosis, decreased mucociliary clearance, excessive secretions and clinical stability (closed suctioning, open suctioning, added mechanical device such as IPV, mechanical in/exsufflation)) • Apply appropriate physiotherapy techniques in response to clinical problems encountered (V/Q mismatch, atelectasis, pneumothorax, increased cranial pressure) 			Oral examination Case based discussion Mini-CEX Simulation DOPS Portfolio		
6. Aerosol therapy and humidification	<ul style="list-style-type: none"> • List the aerosol medications that maybe used in intubated patients • Identify aerosol treatments that are specific to a disease pathology • Discuss the indications and contraindications for aerosol therapy in intubated patients • Describe the different methods of delivery and positioning depending on the device and ventilator circuit used for aerosol therapy • Describe the appropriate hygiene measures in relation to the equipment used • Justify the use of therapy with the relevant evidence • Select appropriate timings for aerosol therapy 	<ul style="list-style-type: none"> • Appropriately apply and evaluate the addition of aerosol therapy within the circuit • Monitor patient response to the aerosol therapy • Change the aerosol system in accordance with hospital guidelines • Ensure patient safety (verify aerosol performance) • Apply appropriate hygiene measures • Select appropriate humidification system HME/HH in respect of guidelines and hospital protocol • Verify the efficacy of system in place (secretion quality; tube patency, filter resistance, humidifier temperature) 	Module specific attitudes: <ul style="list-style-type: none"> • Use motivation techniques to maximize patient's compliance to procedure and treatments (such as relaxation techniques) 		Oral examination Case based discussion Mini-CEX Simulation DOPS Portfolio		

Syllabus item	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment methods	Level of Assessment	Minimum Clinical and Educational Exposure
	<ul style="list-style-type: none"> Describe normal airway humidity Explain the rationale for humidifying inspired air with regard to mechanical ventilation Describe various types of humidifiers such as HME; heated humidifiers (HH) indicating the pros and cons of each system Justify the use of each system in respect to clinical situations 	<ul style="list-style-type: none"> Identify possible risks (temperature, condensation, filter blockage etc.) Change humidification system in accordance with hospital procedure (hygiene) adapt tubing etc.) Ensure patient safety (check equipment is working properly) 					
7. Lung recruitment	<ul style="list-style-type: none"> Explain the rationale for lung recruitment Review the various techniques for lung recruitment Compare and contrast the benefits and risks of the different possibilities 	<ul style="list-style-type: none"> In accordance with the hospital protocol/current guidelines, apply the appropriate recruitment techniques such as positioning (side lying, sitting, prone positioning), ventilator settings (inspiratory pressure, PEEP) Identify the potential risks for the different techniques Adapt the techniques to be effective (improved auscultation, improved O₂ saturation and ABG, X-ray, while ensuring patient safety) 			<ul style="list-style-type: none"> Oral examination Case based discussion Mini-CEX Simulation DOPS Portfolio 		
8. Instructing patients and family members	<ul style="list-style-type: none"> Discuss effects of equipment, procedures, noise, sleep disturbances, and communication barriers in patients receiving mechanical ventilation Inform related to the physiotherapy applications 	<ul style="list-style-type: none"> Provide pertinent information verbally and in written form In collaboration with nursing staff establish methods of communication (such as eye/head movements, picture chart, written form, computer, phonation tube, etc.) Respect hospital policy for giving information to family, doctor, nurse Inform patients and family on aspects of care in which they can participate 			<ul style="list-style-type: none"> Oral examination Case based discussion Mini-CEX Portfolio 		
9. Safely handling the ICU patient	<ul style="list-style-type: none"> Identify the risks related to patient handling during physiotherapy treatments in ICU Recall alarms systems in relation to mechanical ventilation and physiotherapy Explain the advanced life support Recall procedures for initiating resuscitation in the event of significant acute deterioration 	<ul style="list-style-type: none"> Adapt the positioning of patients to ensure optimal treatment. Organise with nurse in charge of patient the timing of treatments (examinations, administration of sedation, pain relief etc.) Secure any equipment to prevent undesirable effects, i.e., accidental tube, drain or catheter removal Adapt monitoring and alarm settings if indicated or required for certain situations (exercise therapy, mobilisation etc.) Document and inform medical staff of patient deterioration Initiate resuscitation technique if/when indicated 			<ul style="list-style-type: none"> Oral examination Case based discussion Mini-CEX Simulation Direct observation of practical skill E-portfolio 		