International curriculum recommendations for training in thoracic oncology

Prepared by the ERS respiratory Oncology educational task force

This curriculum matrix has been developed by a Task Force with members coming from varied specialties: respiratory medicine, medical oncology, radiation oncology, thoracic surgery and clinical pathology. This purpose of this curriculum is to provide recommendations on educational strategies and a training framework which is interprofessional and multidisciplinary. The training is designed as a post-graduate training programme and a part of continuing medical education leading to an additional certificate attesting to an advanced expertise in **Thoracic Oncology**.

The curriculum is the scaffolding or structure to allow the target audiences to learn with, from and about each other to improve collaboration and the quality of care for patients. The curriculum matrix has been completed by task force members from different specialties but working closely with thoracic oncology patients.

This curriculum outlines the:

- **syllabus** stating the content required for training
- **knowledge, skills and attitudes** or the **learning outcomes** guiding the learner and trainer to achieve prescribed outcomes
- **suggested assessment tools** including methods that can be applicable in various settings. Assessments are linked to the learning outcomes and the level of assessment required.
- **level of assessment** based on Miller's model of clinical competence.
- **minimum clinical/educational exposure** relating to time, number of cases and/or certain specific actions of the learner. Minimum clinical exposure refers to indicative minimum numbers of procedures/patient cases that each learner should be directly exposed to over the entire duration of their training.
- **teaching and learning opportunities** providing examples of teaching or learning activities suitable for the learning outcome. This should orient the learners and trainers on how to learn or acquire the specific learning outcome or how to prepare the training programme accordingly. This also prescribes an appropriate teaching method or may include a sample clinical situation. This may include informal and/or formal learning opportunities suitable for post graduate learning environments.

Target audience

Thoracic oncology specialists are expected to be well experienced clinicians who treat thoracic tumours in a specialised centre. Therefore, the target audience are respiratory physicians, medical oncologists, radiation oncologists or thoracic surgeons. Each of these specialists is familiar with the collaborating disciplines. This permits them to understand and appreciate the contribution of each specialty in the treatment of thoracic tumours. Thoracic oncology specialists are therefore in a position to lead a multidisciplinary thoracic oncology team and chair the tumour board.
Accordingly, the prerequisites to complete training include:

- being a specialist in a discipline that is involved in the diagnosis and treatment of thoracic tumours
- and, to have a recognised certificate for practice in the country in which the learner is currently working

Organisation of training

This curriculum has been designed as a training programme for post-graduate and continuous medical education. This is a modular training programme with modules that depict the various specialties involved in the diagnosis and treatment of thoracic tumours.
Depending on the specialty of the learner, modules on general thoracic oncology and that of other specialties other than his own must be completed. As an example, a radiation oncologist will not need to go through the module on radiation therapy (Module 12) while training for thoracic oncology.

Module competency

For each module, the competencies required of the trainee are written as general statements. These have been composed considering the knowledge, skills and attitudes prescribed within the module.

Learning Outcomes

The learning outcomes in each of the curriculum modules state what will be learned and how the learning will be demonstrated. In this curriculum, the learning outcomes are organised into the three learning domains knowledge, skills and attitudes.

Table 1 Translations into the 24 official / working languages in the EU of the learning domains used in the curriculum

EU Official / Working language	Learning Domains		
English	Knowledge	Skill	Attitude
Bulgarian	знания (znaniya)	умения (umeniya)	поведение (povedenie)
Croatian	znanje	vještina	stav
Czech	znalost	dovednost	postoj
Danish	viden	dygtighed	holdning
Dutch	kennis	bekwaamheid	houding
Estonian	teadmised	oskus	suhtumine
Finnish	tuntemus	taito	asenne
French	savoir	savoir faire	savoir être
German	Wissen	Fertigkeiten	Haltungen und Verhalten
Greek	γνώση (gnósi)	επιδεξιότητα (epidexiótita)	στάση (stási)
Hungarian	tudás	jártasság	hozzáállás
Irish	eolas	scil	dearcadh
Italian	conoscenza	abilità	competenza
Latvian	zināšanas	prasme	attieksme
Lithuanian	žinios	įgūdis	požiūris
Maltese	għarfien	ħiliet	attitudni
Polish	znajomość	umiejętność	postawa
Portuguese	conhecimento	habilidade	atitude
Romanian	cunoştinţe	abilitate	atitudine
Slovak	vedomosti	zručnosť	postoj
Slovenian	znanje	spretnost	odnos
Spanish	conocimiento	habilidad	actitud
Swedish	kunskap	skicklighet	attityd

The table above shows the translations of the learning domains (knowledge, skills and attitude) used in the curriculum. Google translate (**translate**.**google**.com) was used. The Task Force endeavours to improve the understanding of readers of the curriculum who are not native English speakers. For any inaccuracy, please contact hermes@ersnet.org to correct the terminology in any specific language.

Gamarra F, Noel JL et al. Thoracic Oncology HERMES: European curriculum recommendations for training in thoracic oncology. *Breathe*. [In Press]

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure

References used for translations:
Official languages of the EU. European Commission Official Website. http://ec.europa.eu/languages/policy/linguistic-diversity/official-languages-eu_en.htm *Last accessed 2 May 2016*

Balk EM, Chung M, Chen ML, et al. Assessing the Accuracy of Google Translate to Allow Data Extraction From Trials Published in Non-English Languages [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2013 Jan. Discussion. Available from: http://www.ncbi.nlm.nih.gov/books/NBK121306/. *Last accessed 2 May 2016*

Minimum duration of training
The Task Force recommends a minimum of 12 months and a maximum of 24 months training. Reflecting this duration, minimum numbers of cases within the curriculum are generally 5 or less. This would approximately total a case-mix of 80 cases. The Task Force further recommends that while training in thoracic oncology, the learner will shadow each specialty with the view of completing the prescribed minimum clinical exposure in a portfolio with guidance or mentorship from the specialist i.e. thoracic surgery, medical oncology, respiratory medicine and radiation oncology to a total of 5 working days for each specialty that is not their own. This would mean 20 working days cumulated throughout the one year duration of training.

Assessment
During the development and design of the curriculum, Task Force members considered appropriate assessment methods using the Miller's model of clinical competence (below) with consideration of appropriate tools and the environment where they can be effectively delivered. Selection of appropriate assessment methods fit for purpose are essential to the validity of assessments and to predict whether the learner can be 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.

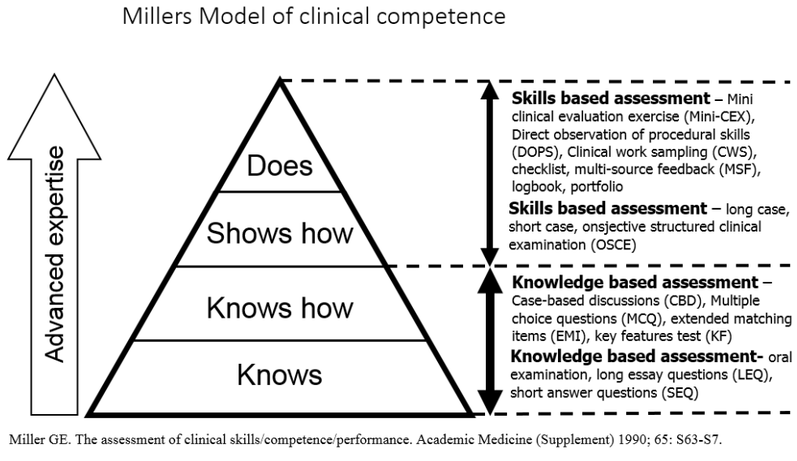

Diagram 1: Miller's model of clinical competence adapted from

Assessment methods used in the curriculum

Assessment of 'Knows' and 'Knows How' (Level 1 & 2 according to Miller)

- *Oral examination*
  One or more examiners ask a candidate questions. Examiners use a blueprint in selecting areas for the content of the questions. A structured marking scheme is used. Often, oral examinations are conducted in conjunction with long and short cases.
- *Long essay questions (LEQ)*
  A long essay is a piece of prose that varies in length from several paragraphs to several pages. The LEQ has a question stem which often contains a phrase such as: `Describe the management of ...'.
- *Short answer question (SAQ)*
  The short answer question is an open ended, semi-structured question format. This can be a practical alternative to the long essay question. A structured, pre-determined marking scheme improves objectivity.
- *Multiple choice questions (MCQ*)
  The MCQ is a restricted response, objective assessment instrument which contains:
  - A stem or a description of a problem
  - Lead-in or the question, and
  - Option list

  ERS use single best answer or true/false formats in their knowledge assessments
- *Extended matching items (EMI)*
  EMI is a relatively new format of objective testing. It is somewhat similar to the MCQ, except that is based on a single theme and has a long option to avoid cuing. It is also known as extended matching question (EMQ).

Assessment of 'Shows How' (Level 3 according to Miller)

- *Long case*
  Involves the use of a non-standardized real patient. The candidate is usually assessed on one long case and three to four short cases with oral examination. The candidate may or may not be observed during the examination.
- *Short case*
  Involves the use of three to four non-standardized real patients with one to two examiners. Usually there is a common marking scheme for all the cases.
- *Objective structured clinical examination (OSCE)*
  OSCE consists of multiple stations (usually 15-20) where each candidate is asked to perform a defined task such as taking a focused history or performing a focused examination of a particular system. A standardized marking scheme specific for each station is used.

Assessment of 'Does' (Level 4 according to Miller)

- *Mini clinical evaluation exercise (Mini-CEX)*
  Mini-CEX is a rating scale developed by the American Board of Internal Medicine (ABIM) in the 1990sS to assess six core competencies of residents: (1) medical intervention skills, (2) physical examination skills

References
Miller GE. The assessment of clinical skills/competence/performance. Academic Medicine (supplement). 1990; 65: S63-S7
Zubair, A., Seng, C.Y., & Eng, K.U. Practical Guide to Medical Student Assessment. 2006. Singapore. World Scientific Publishing Co.Pte.Ltd.

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 1: General principles of the biology of thoracic cancers							
Module competency:	The learner is able to apply principles and concepts of lung carcinogenesis including oncogenes, tumour suppressor genes and different signalling pathways appropriately in clinical practice and when participating in research.						
1 Carcinogenesis	• Explain the principles of carcinogenesis • Recall mechanisms of carcinogenesis • Classify mediators and inhibitors of carcinogenesis • Explain the field carcinogenesis concept • Discuss pre-invasive lung lesions	• Assess and interpret published/unpublished data regarding carcinogenesis mechanisms and translate that into clinical practice • Recognise and refer appropriately patients with pre-invasive lung lesions	• Communicate effectively with patients and family about the nature of pre-invasive lung lesions and further action plan • Promote research in the field of carcinogenesis by participating in research projects • Collaborate with other members of the multidisciplinary team to promote research in the field	• Case-based discussion of the management of patients with pre-invasive lung lesions	• MCQ	2	• Attendance to a postgraduate seminar on carcinogenesis and pre-invasive lung lesions • Discussion of at least 5 patients with pre-invasive lung lesions
2 Tumour immunology	• Describe tumour-associated antigens • List basic principles of immune response to cancer • Identify escape mechanisms of antigenic tumours • Explain principles and methods of cancer immunotherapy • Describe epidemiology and risks of the immunocompromised cancer patient	• Select and advise potential candidates for cancer immunotherapy • Interpret tumour-associated antigens in the clinical setting • Assess and manage immunocompromised patients with thoracic malignancies	• Collaborate with other members of the multidisciplinary team • Communicate effectively with patient and family about cancer immunotherapy	• Selection and management of patients for cancer immunotherapy • Management of immunocompromised patients with thoracic malignancies	• MCQ	2	• Attendance to a postgraduate seminar on cancer immunotherapy • Discussion of at least 5 cases for cancer immunotherapy and at least 10 immunocompromised cancer patients and their treatment plan •
3 DNA damage and repair	• Differentiate types and sources of DNA damage • Discuss DNA repair mechanisms and DNA damage and repair in carcinogenesis	• Interpret relevant data to apply in clinical practice such as ARCC1 expression • Identify applications of results in clinical practice	• Demonstrate self-directed learning	• Case-based discussion of an application of basic research outcomes into clinical practice	• MCQ	2	• Appraise 5 recently published literature in the field
4 Epigenetics	• Recall basic principles of • DNA methylation • Histone modifications • RNA-Associated silencing • Mi-RNA and lung cancer • Mitochondrial mutations • Microsatellite instability • Epigenetic therapies	• Interpret published literature	• Collaborate with multidisciplinary scientific groups to promote and participate in research in the field • Set up or participate in clinical trials on epigenetic therapies • Obtain a valid consent from patient or act appropriately if consent is withheld or cannot be obtained		• MCQ	2	
5 Oncogenes and tumour suppressor genes	• Recall definition and basic functional principles of proto-oncogenes and oncogenes in lung cancer • Discuss targetable oncogenes in lung cancer • Differentiate inherited and acquired abnormalities-mutations of tumour suppressor genes • Identify currently available	• Participate in a relevant clinical trial and interpret results • Evaluate indications for investigation of tumour oncogenes in lung cancer patients • Identify patients with oncogenes and tumour suppressor genes and with potential for participation in a	• Collaborate with the other members of multidisciplinary team to initiate/promote relevant clinical research and undertake therapeutic decisions • Communicate effectively with patients and family members regarding therapeutic novelties and recruitment in clinical trials	• Management of patients with oncogenic driver mutations in lung cancer	• Case based studies • Oral examination • Portfolio	4	• Management of at least 10 lung cancer patients with oncogenic mutations in lung cancer • Attend scientific activity (workshop, PG course etc) on targeted therapies in lung cancer (incl. oncogenic driver mutations)

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
	targeted therapies	clinical trial					
6 Cell cycle and apoptosis	• List regulators of the cell cycle • Review regulators of apoptosis • Discuss the role of c-Myc, RAS, PKA,BCL-2, • Explain links between cell cycle and apoptosis • Describe evasion of apoptosis • Describe death receptor deregulation	• Interpret research data in the field • Identify potent application of results in clinical practice	• Promote relevant research	• Reading relevant literature on the application of basic research outcomes into clinical practice	• MCQ	1	• Appraise 5 recently published literature in the field • Attendance of 1 relevant scientific activity
7 Growth factors and signalling pathways	• Describe pathogenesis of lung cancer signalling pathways • Discuss abnormalities in lung cancer signalling pathways • Discuss targeting signalling pathways • Explain lung cancer in the non-smoking individuals' correlation with signalling pathways	• Identify patient displaying abnormalities in signalling pathways	• Demonstrate initiative to collaborate with scientific groups to promote research in the field and translate into clinical practice	• Case-based discussion of the management of patients with defects in growth factors and signalling pathways	• Portfolio	4	• Discussion of a minimum of 5 patients
8 Oncogenic driver mutations	• State definitions for oncogenic driver mutations • Consider causes of oncogenic driver mutations • Ascertain indications for investigating oncogenic driver mutations	• Select patients to be investigated for oncogenic driver mutations • Identify oncogenic driver mutations in clinical practice • Select patients for relevant targeted therapies	• Translate guidelines into a custom made approach for an individual patient • Demonstrate up-to-date knowledge of oncogenic driver mutations and targeted therapeutic strategies • Promote relevant clinical research and recruitment into clinical trials	• Management of patients with oncogenic driver mutations	• MCQ • Case based discussion • Mini clinical evaluation exercise	4	• Management of a minimum of 10 patients with oncogenic driver mutations
9 Tumour microenvironment and angiogenesis	• Discuss in vitro and in vivo models of tumour growth and invasion • Explain extracellular matrix remodelling • List regulators of angiogenesis • Discuss correlation of angiogenesis with prognosis and clinical outcome in thoracic malignancies • Discuss tumour microenvironment and emerging roles in lung cancer therapy	• Select patients for antiangiogenetic treatments • Interpret relevant data and translation into clinical practice • Interpret angiogenetic markers in pathology reports	• Set up and promote clinical research in the field • Communicate effectively with patients and family about novel relative treatments	• Participate in the decision to treat and management of patients receiving antiangiogenic factors	• Portfolio	4	• Appraise 5 recently published literature in the field • Attendance of 1 relevant scientific activity

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
10 Mechanisms involved in metastasis	• Describe key molecular and cellular mechanisms • Discuss inflammatory processes involved in metastasis • Explain the role of stem cells • Evaluate patterns of metastasis	• Diagnose, work up and manage metastatic lung cancer • Select patients eligible for treatment (all modalities) • Translate national and international guidelines for metastatic lung cancer into individualised patient management • Interpret research in metastatic mechanisms into clinical practice	• Collaborate with the multidisciplinary team for optimal management of patients with metastatic lung cancer • Remain up to date on current guidelines • Explain the diagnosis and treatment options to the patient and/or family • Immediate and appropriate urgent referral to another specialist	• Management of patients with metastatic lung cancer	• Case based discussions • MCQ • Mini-Clinical Evaluation Exercise	4	• Management of at least 50 patients with metastatic lung cancer
Module 2: Risk factors and epidemiology							
Module competency:	The learner is able to perform patient-centred clinical assessment and establish a management plan based on the risk factors and epidemiology of lung cancer and the different lung carcinogens.						
1 Descriptive epidemiology of intrathoracic tumours	• Appraise worldwide, European and local trends of incidence-prevalence survival in intrathoracic tumours • Analyse epidemiology trends according to sex, age, ethnicity, race, smoking habit	• Collect local epidemiological data on thoracic tumours • Report epidemiological data to local/national/European registries • Measure and interpret descriptive epidemiology data of lung and thoracic cancers • Participate in the management and development of services to meet changing epidemiological trends	• Communicate epidemiological trends and prognosis relevant to the clinical case in a clear and understandable manner for patients and families • Communicate needs of services to meet epidemiological trends in a clear and understandable manner with hospital management • Accepts the need to remain up to date on knowledge about epidemiology of thoracic cancers • Support local authorities in setting up and maintaining epidemiological databases	• Participation in the collection, interpretation, and communication of epidemiological data and trends in thoracic malignancies	• MCQ • Portfolio	4	• Attendance of an educational activity related to epidemiology • Setting up and/or maintaining an epidemiology database locally/nationally/ internationally

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Tobacco	• Discuss current epidemiology of active and passive smoking worldwide and nationally • Describe pathogenic mechanisms of tobacco and lung cancer • Explain the effect of tobacco smoke carcinogens on tumour suppressor genes and oncogenes • Explain nicotine addiction and withdrawal symptoms • Summarise social and cultural aspects of tobacco consumption • Propose programs for smoking cessation (behavioural, pharmacologic, health benefits, risks) • List local/national/international smoking cessation guidelines • Review smoking prevention • Devise a plan for smoking cessation for an individual patient	• Measure and analyse data regarding tobacco consumption in patients with intrathoracic tumours • Refer to a tobacco cessation specialist	• Communicate effects of tobacco consumption in a clear and understandable manner with patients and families • Encourage and support individuals to quit smoking • Discourage passive smoking • Encourage a smoke-free culture among colleagues and health care professionals • Support setting up smoking cessation services locally • Campaign locally/nationally/internationally for smoke-free culture • Avoid conflicts of interest with tobacco industry • Describe the availability and access to local services and pathways for smokers wishing to quit	• Encouraging and supporting smokers with thoracic malignancies to quit smoking during clinical work • Attend a seminar on smoking cessation	• MCQ • Portfolio	4	• Encourage and support a minimum of 5 smokers with thoracic malignancies to quit smoking and audit their compliance
3 Air pollution (outdoor and indoor)	• Discuss prevalence and incidence of thoracic malignancies in areas with air pollution • Describe air pollution factors causing lung cancer • Compare potential mechanisms of carcinogenicity of compounds related to air pollution • Discuss social, economic and public health considerations • Report on regulatory issues • Ascertain a cause-determination of causal relationship between cancer and air pollution • Argue on the relationship between air pollutants and thoracic malignancies	• Identify patients with considerable exposure to air pollution carcinogens • Identify symptoms caused by patient's exposure to air pollution	• Communicate the impact of air pollution in thoracic malignancies in a clear and understandable manner for patients and families • Support campaigns for the prevention of air pollution • Feedback to public health authorities existing concerns about clustering of cases • Discourage patients from emitting indoor/outdoor air pollutants • Support task forces/initiatives for the elimination of air pollution	• Study of current literature	• MCQ	2	• Attend scientific symposium on air pollution
4 Asbestos	• List sources and types of exposure • List protective measures • Discuss asbestos exposure and risk for intrathoracic tumours • Describe pathology, pathogenesis, epidemiology, clinical and radiographic features, diagnosis, treatment and prognosis for • Non-malignant pleural manifestations (acute benign pleural effusions, rounded atelectasis, diffuse pleural thickening, pleural plaques) • Malignant mesothelioma	• Appraise asbestos exposure in patients • Recognise causal relationship between clinical entity and asbestos exposure • Refer for compensation when/where appropriate	• Communicate the risks and results of asbestos exposure in a clear and understandable manner for patients and families • Demonstrate awareness of and proactive attitude against asbestos exposure	• Interdisciplinary management of patients with an asbestos related lung/thoracic malignancy (including MDT-discussion) • Reporting cases of asbestos related lung/thoracic malignancy to local authorities	• MCQ • Case Based Discussion	2	• Discuss a minimum of 2 patients with asbestos related thoracic clinical entities • Participate in an educational activity about the carcinogenic effects of asbestos

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
	• Asbestosis • Lung cancer related to asbestos • Evaluate regulations for asbestos control • Support and justify precautions in asbestos exposure						
Other environmental and occupational carcinogens include air pollution							
5 Other occupational carcinogens	• Distinguish representative occupational carcinogens causing lung and thoracic malignancies; causal relationships • Classify types of exposure and precautions • Appraise diagnostic tests • Describe exposure assessment • Explain epidemiology	• Identify patients with exposure to occupational carcinogens • Investigate causal relationship between occupational carcinogen and malignancy in a patient • Detect thoracic malignancies whether they are of environmental and occupational origin	• Accepts the need for adopting precautions against occupational carcinogens • Communicate about impact of occupational carcinogens to lung health in a clear and understandable manner with patients and family • Inform local authorities on safety issues related to occupational carcinogens	• Case-based learning • Multidisciplinary management of a case, if possible	• MCQ	2	• Participate in an educational activity about occupational carcinogens
6 Radon decay products	• Name sources of radon and its decay products • Describe forms of exposure • Discuss measurement, assessment and symptoms of exposure • Explain impact on carcinogenesis • Discuss the half-life of radon decay products	• Identify patients with radon decay products exposure • Investigate causal relationship between exposure to radon decay products and lung cancer	• Accepts the need for awareness and proactive attitude towards precautions against radon decay products • Communicate the relation of radon decay exposure with lung cancer in a clear and understandable manner for patient and family • Support local authorities to eliminate radon exposure	• Case-based learning	• MCQ	2	• Participate in an educational activity about non-tobacco-carcinogens
7 Chronic inflammation (COPD, infections)	• Review relationship between COPD and lung cancer • Discuss incidence of lung cancer in COPD • Discuss incidence of COPD in lung cancer	• Evaluate patients with COPD and lung cancer • Diagnose COPD in patients with thoracic malignancies	• Assist the patient and family in understanding the particularities of coexisting lung cancer and COPD	• Management of patients with chronic inflammation (COPD, infections) and lung/thoracic malignancies	• MCQ • Case-based discussion	2	• Manage a minimum of 10 patients with coexisting COPD and lung cancer
8 Genetic susceptibility and gene-environment interactions	• Recall common gene variants associated with lung cancer • List types of gene-environment interactions • Describe gene environment interaction and modulation of lung cancer risk	• Identify subjects with possible genetic susceptibility to lung cancer and refer to genetic services/research	• Inform and guide patients with this background to relevant services • Refer to genetic counselling when/where appropriate	• Case-based learning	• MCQ	2	• Participate in an educational activity about genetic susceptibility in lung cancer and gene-environment interactions

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 3: Clinical presentations							
Module Competency:	The learner is able to recognise and address appropriately various clinical presentations, perform a patient-centred clinical assessment and establish a management plan.						
1 Performance status (PS)	• Recall definitions of different performance status (PS) grades: Eastern Cooperative Oncology Group (ECOG) / WHO / Zubrod, Karnofsky, Global Assessment of Functioning • Assess implications of PS with the choice of treatment and diagnostic procedures • Review implications of PS with participation in clinical trials	• Grade patients according to their performance status • Assess patient suitability to undergo different treatments and/or diagnostic procedures according to their performance status • Assess patients' suitability to participate in clinical trials as per their PS • Balance risk-benefit ratio for treatments/diagnostics as per patients' PS	• Communicate effectively with patients and family members about PS and what limitations/advantages this gives to the choice of therapeutic/diagnostic procedures as well as participation in clinical trials • Collaborate with the team to determine treatment/investigations and palliative care as per PS • Show empathy to patients and family members	• Participating in giving expert opinion about management of lung cancer patients of all/any PS grades • Facilitating relevant case-based discussions with multidisciplinary approach	• Case based discussion • MCQ	2	• Treat/triage lung cancer patients with different Performance status (a minimum of 20 from each grade as per ECOG)
2 Signs and symptoms 2.1 Cough 2.2 Haemoptysis 2.3 Chest pain 2.4 Dyspnoea 2.5 Wheezing 2.6 Stridor 2.7 Hoarseness 2.8 Phrenic nerve paralysis 2.9 Dysphagia 2.10 Pleural effusion 2.11 Palpable peripheral lymph nodes Chest wall deformities 2.12 Superior vena cava syndrome 2.13 Pancoast syndrome 2.14 Pericardial effusion 2.15 Lymphangitic spread 2.16 Bone metastases 2.17 Brain metastases 2.18 Liver and adrenal metastases 2.19 Other metastatic sites	• Discuss incidence of each symptom and their correlation with clinical outcome • Describe pathophysiology of symptoms • Determine management of symptoms and signs • Explain differential diagnosis • Discuss diagnostic work up for symptoms and signs • Evaluate treatment guidelines • Describe palliation • Discuss palliative/therapeutic interventional procedures	• Identify symptoms and oncological emergencies • Select patients for palliative/therapeutic /diagnostic procedures • Identify symptoms and assess signs related to thoracic malignancies (including physical examination) • Obtain sufficient information from patient's history	• Show empathy to patients and family members • Collaborate and communicate effectively with members of the multidisciplinary team and actively participate in the decision making process • Consider patients eligible for palliative services • Describe availability and access to support services for patients and families • Communicate the multidisciplinary team consensus to the primary health care setting and make all necessary arrangements for the patient in the community	• Identification and management of all symptoms and signs of patients with thoracic malignancy	• Case based discussion • Oral examination	2	• Discuss a minimum of 60 patients (20 under supervision and 40 independently) with thoracic malignancies and any of the mentioned symptoms and signs. A minimum 5 patients (from 60) should have any of the life threatening symptoms

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
3 Paraneoplastic syndromes	• Describe the following: - Cachexia - Hypercalcemia - Thromboses and pulmonary embolism - Syndrome of inappropriate antidiuretic hormone - Ectopic adrenocorticotropin hormone syndrome - Lambert Eaton syndrome - Clubbing and periostitis • Recall incidence of paraneoplastic syndromes and its correlation with outcomes • Discuss pathophysiology and aetiology of symptoms • Describe diagnostic work up and differential diagnosis • Compare management of symptoms and signs	• Identify patients with paraneoplastic syndromes • Identify life threatening symptoms and signs and offer /refer for rescue treatment	• Obtain sufficient information from patient's history • Demonstrate empathy to patients and family members • Collaborate and communicate with members of the multidisciplinary team and actively participate in the decision making process • Communicate the multidisciplinary team consensus to the primary health care setting and make all necessary arrangements for the patient in the community	• Manage patients with any paraneoplastic syndrome related to a thoracic malignancy • Presentation and discussion of patients with paraneoplastic syndromes in the multidisciplinary team meetings and participate in the proposal of clear action plans	• CBD • MCQ	3	• Discuss a minimum of 20 patients with any paraneoplastic syndrome
Module 4: Diagnostic approaches and procedures							
Module Competency:	The learner is able to propose an individualised diagnostic and staging strategy.						
1 Principles of screening, target population, biases	• Recall general principles of screening • Discuss selection criteria for screening • Explain methods of screening and screening pathway • Appraise lead-time, length-time, and over-diagnosis biases • Describe indications for screening for lung cancer/thoracic malignancies in high risk populations • Describe evidence for screening programmes/ guidelines • Review developing methods of lung cancer screening	• Select and advise potential candidates for screening • Interpret screening results • Manage significant findings	• Communicate effectively with patients/family regarding the benefits and risks of screening • Communicate effectively with patients/family regarding further management of significant findings • Promote participation in smoking cessation programmes	• Attendance in post-graduate seminars discussing selection and management of individuals for lung cancer screening	• MCQ • Case based discussions	2	• Attend a post-graduate seminar including thoracic oncology screening

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Imaging (Chest-X-ray, computer tomography, PET and PET-CT, thoracic ultrasound, bone scanning, magnetic resonance imaging, SPECT, Octreotide) *Refer to Module 5: Imaging*	• Ascertain indications-and contraindications for each imaging modality • Recall sensitivity and specificity for lung cancer, mediastinal disease, distal metastatic disease • Identify abnormalities in thoracic imaging with a main emphasis in CXR, CT scan and PET CT scan • Describe pre-procedural preparation of special categories of patients (allergic/renal failure, diabetic, pregnant, claustrophobic etc) • Review risks and benefits of imaging options in vulnerable groups (e.g pregnant women, young adults, frail elderly, mental health patients, patients that lack capacity)	• Select patients appropriately for each investigation • Interpret results • Assess staging of disease	• Communicate with patients and family regarding indications, risks, benefits, clinical implications of each imaging modality	• Selection of appropriate imaging modalities for each patient (new diagnosis, recurrence) • Interpretation of findings in clinical practice	• Mini –CEX • Portfolio	4	• Attend a postgraduate course on thoracic oncology imaging • Appropriate selection and staging of at least 30 patients with suspicion/confirmed diagnosis of thoracic malignancy (including one carcinoid)
3 Imaging guided biopsy (CT, U/S, Magnetic navigation) *Refer to Module 5: Imaging*	• Describe the procedure • Define indications and contraindications for a particular procedure • Assess complications and risks • Recall principles of patient preparation prior to imaging guided biopsy	• Select appropriate patients • Conduct clinical pre-assessment for patient's suitability for the procedure • Perform post procedure care and management of complications	• Communicate effectively with patients and family regarding the selected procedure (risks, benefits) and clinical implications on the patient's care	• Clinical case-based review and discussion • Interpretation of results in clinical practice	• Portfolio • Mini-CEX	4	• Attend 5 CT guided lung biopsies and 5 U/S guided lymph node biopsies /pleural biopsies
4 Bronchoscopy and thoracoscopy	*Refer to Module 6: Diagnostic and interventional bronchoscopic techniques and medical thoracoscopy*						
5 Open lung biopsies and VATS	• Describe technique, indications, contraindications, complications and risks • List the principles of patient preparation and evaluation prior to the procedure • Describe the topographical anatomy of the thorax • Discuss open lung biopsies and VATS technique • Describe post-surgical care of the patients • Manage anticoagulation before and after the procedure	• Select appropriate patients • Interpret results	• Communicate effectively about risks, benefits, and the results of the procedure with the patient and/or family	• Discussion of a patient that underwent open lung biopsy/VATS which secured the diagnosis	• Mini CEX • Portfolio	4	• Attend at least 2 open lung biopsies and VATS (for non surgical specialties)

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
6 Mediastinoscopy, endobronchial ultrasound (EBUS) and Esophageal Ultrasound(EUS)	• Discuss indications, contraindications, complications, and risks • Recall sensitivity and specificity in thoracic malignancy • Discuss anatomical limitations of mediastinoscopy/EBUS • Describe patient preparation and evaluation prior to the procedure • Describe the lymph node anatomy of the mediastinum • Describe the mediastinoscopy technique • Describe the EBUS technique • Describe possible per-procedure quality controls and standards • Discuss post procedure care of the patients • Explain conditioning of samples • Manage anticoagulation before and after procedure	• Select appropriate patients • Pathology specimen handling • Interpret positive and negative findings and further management planning	• Discuss the risks, benefits, and the results of the procedure with the patient and/or family	• Presentation of diagnostic work up of a patient with mediastinal disease	• Mini CEX • Portfolio	4	• Attend at least 2 EBUS and at least 2 mediastinoscopies • Discuss the diagnostic approach of at least 20 cases with mediastinal involvement at MDT meeting
7 Pulmonary nodule: diagnostic algorithm *Refer to Module 5 item 3 on solitary nodules*	• Define a pulmonary nodule • Describe different types of nodules • Recall the incidence of pulmonary nodules; benign, malignant • Discuss risk stratification and categorization of patients • Describe diagnostic work-up of patients with newly diagnosed pulmonary nodule(s) • List the principles of radiological follow up of nodules • Discuss the particularities of ground glass lesions and part solid nodules	• Differentiate high from low risk patients • Follow the validated algorithms • Select appropriate imaging tests • Select appropriate patients for histological confirmation • Select appropriate method for histological confirmation • Select patients for surgical resection	• Communicate with patient/family on the risk stratification and management strategy • Collaborate with the members of the multidisciplinary team	• Clinical case review of a patient with persisting solid/part solid/ground glass opacity	• Mini CEX • Portfolio	4	• Discuss, and manage a minimum of 10 patients with pulmonary nodules and at least 5 patients with ground glass /part solid nodules
8 Serum tumour markers	• List serum tumour markers in lung cancer • Discuss serum tumour marker tests • Recall specificity, sensitivity • Discuss Indications • Discuss limitations	• Interpret serum tumour markers	• Communicate with patient/family the results and significance of tumour markers • Collaborate with the members of the multidisciplinary team	• Discussion of management plan in patients with elevated tumour markers	• Portfolio • CWS	4	• Interpret serum tumour markers in a minimum of 2 patients
9 Diagnosis and staging *Refer to Module 7 on Clinical and Pathological Staging*	• Discuss the detection of lymph node enlargement • Discuss the selection of appropriate staging imaging • Describe diagnosis algorithms	• Select appropriate target for histological confirmation of disease • Select appropriate patients for sampling metastatic disease • Assess patient's staging status • Select appropriate diagnostic algorithm for each patient • Demonstrate a clear diagnostic and management plan	• Communicate with patient/family the disease stage, survival as well as diagnostic and management strategy	• Discuss patient stage and proceed with diagnostic algorithms	• Portfolio • Mini CEX • MSF	4	• Discuss staging in all patients presented in MDT and proceed with clear diagnostic algorithmic plan

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 5: Imaging							
Module Competency:	The learner will know the indications and limitations of each imaging modality for diagnosis, staging and follow-up of lung cancer patients. The learner will also know the prerequisites for patient preparation for each imaging modality, the contraindications, correctly describe the most frequent presentation of intrathoracic modalities on routine imaging modalities, interpret the results of the radiological report and perform measures of target lesions from archived studies.						
1 Methods and indications of imaging techniques for diagnosis, staging and follow-up of thoracic cancers and other thoracic tumours	• List principles of X ray/CT/MRI/US techniques and nuclear medicine as well as basic knowledge about radioprotection • Describe the basic radiological anatomy of the chest and upper abdomen, identify appropriate structure on routine chest imaging techniques • Discuss limitations, accuracy and complications of each technique in evaluating thoracic tumours • Describe the pathway for performing each imaging modality 1. Chest x-ray - List quality control criteria 2. CT - Discuss the technique and its limitations 3. Bone scanning - Describe different radio-isotopes and carrying molecules that can be used 4. PET-CT s - Discuss the different carrying molecules and radioisotopes that can be used - List limitations of the technique as well as false positive and false negative findings 5. MRI - Discuss the indications for MRI for the evaluation of thoracic tumours - Discuss the advantages of MRI over CT in specific indications 6. Ultrasound - Discuss indications for diagnosis and response evaluation 7. Octreotide - Discuss indications and limitation	• Interpret a plain chest X- ray • Describe accurately normal and abnormal findings • Use reviewing software for the examination and comparisons of imaging modalities • Evaluate the quality of the investigation • Identify lesions described on the report on the chest X-ray and Chest CT • Identify complications when they occur for each imaging modality	• Collaborate and discuss findings with the radiology and nuclear medicine team • Communicate effectively with patients to explain the results of their imaging investigations showing them significant elements and explaining the diagnostic/surveillance workflow	• Presentations at multidisciplinary meeting • A case based discussion for initial staging or re-evaluation of a patient after therapy or surveillance	• Mini CEX • Portfolio • MSF	4	At least: • 80 chest X ray readings and interpretations of patients that were confirmed to have lung cancer • Interpretation of 80 chest CT scans • Interpretation of 10 bone scans • Interpretation of 40 PET-CT • Interpretation of 5chest MRIs

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Interpretation of the imaging pattern of thoracic tumours	• Describe the range of abnormal findings from current imaging modalities	• Perform measurements including comparative measurement of identified abnormalities on the imaging investigations • Discuss with the radiologist/nuclear medicine specialist the appropriate strategy for imaging including interventional radiology	• Demonstrate capable decision making according to each image type and evolution of findings through time	• Evaluation of sample clinical cases	• Mini CEX • Multi-source feedback	4	• At least 80 TNM staging and 50 RECIST (new response evaluation criteria in solid tumors) evaluations
3 Solitary pulmonary nodule *Refer to module 4 Diagnostic approaches and procedures item on pulmonary module*	• Define each type of nodule and mass • Discuss the different modalities for evaluation of nodule volume/growth (bi dimensional vs 3D volume calculations), knowledge of the minimal significant variations • Discuss the natural history of development of peripheral tumours • Describe the anatomical pathological correlation between different radiological images and pathological correspondence • List the indications and limitations of PET in characterising these structures • Discuss the diagnostic algorithms and uncertainty management • List the potential adverse effects generated by investigations in these patients • Discuss risk factors that modulate the malignancy probability of a solitary pulmonary nodule • Discuss existing guidelines for the follow-up of solitary nodules	• Recognise different patterns for nodules (non-solid/partialy solid and solid nodules) on CT • Recognise evolution in size and patterns from one examination to another	• Decide follow-up strategy based on radiological appearance • Discuss with patient the advantages and disadvantages of radiological follow up versus intervention in indeterminate pulmonary nodules based on risk probability and individualised assessment	• Clinical case-based discussion and review	• Case based discussion	2	• Evaluation of at least 50 cases of solitary pulmonary nodules (including at least 10 ground glass and 10 part solid nodules)
4 Interventional radiology	*Refer to Module 12: Principles of radiation therapy*						

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 6: Diagnostic and interventional bronchoscopic techniques and medical thoracoscopy							
Module Competency:	The learner will be able to identify appropriate candidates for each of the interventional procedures included in this module.						
1 Indications and contraindications of bronchoscopy	• Describe indications, contraindications, limitations and risks of diagnostic bronchoscopy and lavage • Recall principles of patient preparation for bronchoscopy and evaluation prior each procedure • Recall principles of sedation • Describe the anatomy of airways and pleural space • Describe bronchoscopy technique	• Select appropriate patients for each procedure • Interpret results • Support post procedure care • Manage anticoagulation pre and post procedure	• Communicate effectively regarding risks, benefits, and the results of the procedure with the patient and/or family	• Discussion and referral of appropriate patients • Discussion of clinical implications of bronchoscopic mapping on patient treatment (e.g surgery, RT)	• Portfolio • Mini CEX	4	• Attendance of at least 5 bronchoscopies (if not a respiratory physician) • Discussion of eligibility for a bronchoscopy of at least 30 patients presented in the lung MDT
2 Therapeutic bronchoscopy (stents, cryotherapy, laser techniques, argon plasma, brachytherapy, electrocautery photodynamic therapy)	• Discuss indications, contraindications and risks of each procedure • Describe principles of patient evaluation for fitness and appropriateness of procedure • Recall principles of sedation • Describe anatomy of bronchial tree • Describe the technique for each procedure • Discuss the limitations and repeatability of each procedure	• Select appropriate patients • Assess repeatability • Assess suitability for combination of procedures • Assess of results • Manage anticoagulation pre and post procedure	• Communicate effectively regarding risks, benefits, and the results of the procedure with the patient and/or family	• Discussion and presentation of a clear management plan of a patient from each category • Discussion of clinical implications of these procedures in future oncological management	• Portfolio • Oral examination • CBD	2	• Attendance of 10 procedures from at least 3 different modalities
3 Diagnostic and Therapeutic pleuroscopy	• Describe the indications, contraindications, limitations, risks and repeatability • Describe the patient preparation prior to the procedure • Describe the patient evaluation for fitness and appropriateness for the procedure • Recall principles of sedation • Describe the anatomy of pleura • Describe the technique	• Assess patient eligibility pre procedure • Manage anticoagulation pre and post procedure • Selection of patients • Interpretation of results • Assess efficacy	• Effective discussion about the risks, benefits, and the results of the procedure with the patient and/or family	• Discussion and clear management plan for these patients	• Portfolio • Oral Examination • CBD	2	• Attendance of at least 5 procedures

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 7: Clinical and pathological staging							
Module Competency:	The learner will have detailed knowledge on the currently recommended staging systems for lung cancer and mesothelioma and perform a patient-centred clinical assessment and establish a management plan.						
1 TNM description	• Describe the anatomy of the thoracic cavity, lungs, heart and mediastinum • Evaluate principles of the IASLC-TNM staging system of lung tumours, especially applied to lung cancer • Evaluate principles of the UICC-TNM staging system for pleural mesothelioma • Determine principles of staging of thymomas and mediastinal germ-cell tumours	• Interpret CT, PET-CT, MR, and x-ray images of the thorax • Measure tumour sizes in the different imaging-modalities • Identify enlarged lymph nodes and their allocations • Identify metastasis and pleural effusion • Identify tumours in the corresponding images and measure them	• Apply the TNM staging system in cooperation with the multidisciplinary team • Discuss the results of tumour staging in the interdisciplinary conference • Obtain a valid consent from patients or act appropriately if consent is withheld or cannot be obtained • Adapt behaviour in a group to be conducive to best outcomes	• Determination of clinical tumour staging in a patient with lung cancer • Determination of clinical tumour staging in a patient with pleural mesothelioma	• Portfolio • Oral examination	4	• Attendance to a postgraduate course on thoracic oncology with more than one lecture on staging • Regular attendance to radiological conferences and tumour boards in a thoracic oncology unit for 12 months
2 T description	• Summarise IASLC-TNM definitions of the T-descriptor for lung cancer and the UICC definitions of the T-descriptor for mesothelioma	• Interpret CT-, PET-CT, MR, and x-ray images of the Thorax • Measure tumour sizes in the different imaging-modalities • Identify infiltration of organs and other structures by the tumour • Identify tumours in the corresponding images and measure them					
3 N description	• Summarise IASLC-TNM definitions of the N-descriptor for lung cancer and the UICC definitions of the N-descriptor for mesothelioma	• Interpret CT-, PET-CT, MR, and x-ray images of the Thorax • Identify enlarged lymph nodes and their allocations • Identify tumours in the corresponding images and measure them					
4 M description	• Summarise IASLC-TNM definitions of the M-descriptor for lung cancer and the UICC definitions of the M-descriptor for mesothelioma	• Interpret CT-, PET-CT, MR, and x-ray images of the Thorax • Identify metastasis and pleural effusion • Identify and measure distant metastasis					
5 Stage grouping	• Assess IASLC-TNM-criteria for lung cancer stage grouping according to the T-, N- and m descriptors • Summarise UICC-TNM-criteria for mesothelioma stage grouping	• Determine tumour staging according to IASLC-criteria using the T-, N- and M-descriptors					

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 8: Pathology of intrathoracic tumours							
Global Theme/Objective:	The learner will be able to condition tissue probes for transport into the pathology institute for fixation and histological as well as molecular-pathologic examination. Further, he will be able to interpret the pathology reports in the context of specific clinical situations						
1 Conditioning of cytological and biopsy specimens for pathology/molecular analysis	• Discuss how to condition tissue probes for histological or cytological analysis, immunhistology and molecular pathology • Recall principles of fixing techniques	• Fix tissue probes in formalin for transport into the pathology institute • Obtain samples and condition cryoprobes for transport into the pathology institute	• Cooperate with pathologists and healthcare professionals in order to apply the most adequate techniques of tissue conditioning. • Cooperate with pathologists, radiologists and specialists of the other TO-clinical disciplines in order to diagnose and treat preinvasive lung neoplasms lesions • Integrate pathologists into the multidisciplinary team and discuss with them the management plan • Attend relevant seminars to acquire knowledge on pathology • Listen to feedback from peers and supervisors or patients • Assist the patient in understanding the condition, treatment plan, prognosis and lifestyle changes as a consequence of the disease/procedure • Act in a manner that is respectful of the patients'' rights, privacy, condition or capabilities	• Tissue extraction and fixation for pathological examination	• Portfolio • Oral examination • OSCE	4	• Working for at least one week in a unit that obtains tissue of malignant intrathoracic lesions (like bronchoscopy unit)
2 Preinvasive lesions of lung neoplasms	• Repeat the definition of premalignant lesions according to pathology-criteria • Discuss detection and histological confirmation of premalignant lesions • Analyse therapeutical options for premalignant lesions, their indications and contraindications • Assess secondary prevention of premalignant lesions and nicotine withdrawal	• Interpret pathology reports with respect to premalignant lesions that require specific therapies. • Discuss and apply therapeutical options for premalignant lesions • For the corresponding specialties: • Perform brachytherapy, kryotherapy or laser resection of premalignant lesions. • Perform limited resection of premalignant lesions. • Screen and detect intrathoracic tumours in persons at risk		• Assessment and therapy of premalignant lesions in a heavy smoker			• Case discussion of at least one patient
3 Pathology of lung neoplasms	• Describe fixation techniques, staining, immunochemistry and molecular pathology techniques • Review differentiation of lung neoplasms according to histological, immunohistochemical and molecular pathology criteria • Discuss staging of the different lung neoplasms • Analyse implications of tumour differentiation for prognosis and therapeutic options • Analyse information on pathology and discuss findings with pathologist and other clinicians			• Interpretation of pathology reports in the context of tumour staging, performance status and comorbidities of the patient and therapy-planning.			• Attend educational activity on diagnosing or treating lung neoplasms

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
4 Pathological classification and molecular pathology of non small cell lung cancer (NSCLC)	• Describe the histological differentiation of all the tumours included into NSCLC, their different presentations, clinical courses and prognosis • Review the histological characteristics of NSCLC tumours • Analyse the impact of molecular pathology on classification of NSCLC tumours • Recall the main genetic alterations of NSCLC tumours and their impact on prognosis and the specific therapies available • Analyse information on pathology and discuss findings with pathologist, radiologists and specialists of the other TO clinical disciplines.	• Request pathological examinations according to the clinical characteristic of patients • Use the information provided by pathologists for diagnostic and therapeutic decisions. • Apply an individualised treatment to patients according to the results provided by pathologists					• Attend an educational activity diagnosing or treating NSCLC • Case discussion of at least 20 patients
5 Pathology and molecular pathology of Neuroendocrine and small cell lung cancer	• Review the histological differentiation and the specific markers of neuroendocrine tumours and SCLC • Analyse information on pathology and discuss findings with pathologist, radiologists and specialists of the other TO-clinical disciplines						• Attend an educational activity on the diagnosis and treatment of neuroendocrine and small cell lung cancer • Case discussion of at least 10 patients
6 Pathology and molecular pathology of mesothelioma	• Describe the histological classification and mesothelioma and its impact on prognosis and therapeutic decisions. • Analyse molecular markers of mesothelioma that may be of relevance in the future.						• Attend an educational activity on diagnosing or treating premalignant lesions of mesotheliomas • Case discussion of at least 2 patients
7 Thymoma and germ cell tumours (frequent mediastinal tumors)	• Select typical localisation of mediastinal tumours • List the WHO-classification of thymoma • Recognise characteristics of germ cell tumours • Analyse information on pathology and discuss findings with pathologist, radiologists and specialists of the other TO-clinical disciplines						• Attend educational activity in diagnosing or treating thymoma and germ cell tumours • Case discussion of at least 1 patient

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
8 Rare mediastinal tumours	• Describe the classification and differentiation of rare mediastinal tumours • Analyse information on pathology and discuss findings with pathologist, radiologists and specialists of the other TO-clinical disciplines						• Case discussion of at least 1 patient
9 Interpretation of pathological reports	• Restate terminology of pathology findings and staging of thoracic neoplasms • Recall terminology of pathological findings and to discuss the findings with the pathologist	• Apply knowledge for decisions on diagnosis and therapy					• Interpret 50 pathological reports
Module 9: Prognostic factors or predictive markers							
Module Competency:	The learner will be able to perform patient-centred clinical assessment and establish a management plan by considering prognostic factors and predictive markers for their patients.						
1 General methodological considerations	• Explain the difference between prediction and prognosis • Interpret statistical significance in prognostic and predictive factors and their implications in clinical practice'	• Integrate prognostic and predictive information into the therapeutic plan		• Assess the prognosis of a case : for example a 55 year old non smoking woman with brain metastases and EGFr mutated adenocarcinoma and communicate this to the MDT, patient and family	• Case-based discussion • MCQ	2	• Participate in the management of a minimum 40 cases where prognostic factors or predictive markers were investigated
2 Clinical factors	• Identify predictive and prognostic factors in the clinical characteristics of the patients: sex, age, PS, stage, ethnic group etc.						
3 Histopathological factors	• Identify and understand predictive and prognostic factors regarding histopathology of the tumour: histological type, particular histology, differentiation, etc.						
4 Molecular markers	• Identify predictive and prognostic factors regarding molecular characteristics related to the tumour: genetic abnormalities (EGFr, Alk, etc.), circulating biomarkers (NSE, CEA, CYFRA, etc.), etc.						

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 10: Principles of thoracic surgery							
Module Competency:	The learner will be able to engage in respectful shared decision making with thoracic surgeons and other colleagues in the multi-disciplinary team.						
1 Oncologic principles of surgery for lung tumours	• Recall surgical oncological anatomy of the chest • Describe natural history of lung cancer • Restate principles of anatomic resection • Restate principles of nodal dissection and arguments in favour • Recall principles of oncologic resectability • Express the importance of completeness of resection (R0) • Assess feasibility of oncologic radical resection • Judge oncologic radicality of the resection	• Present the feasibility of oncologic radical resection among peers	• Communicate basic principles in a clear and understandable manner to patients / relatives / nursing staff • Work in a collaborative manner in order to discuss the pertinence of surgery in MDT • Assist the patient and family • Inform patient and family regarding risks and advantages of various techniques • Communicate with patient and family peri-operatively • Discuss inoperability with patient and relatives • Explain surgical approach to the patient and family as well as colleagues • Explain benefit/risk of extended resections • Explain risk/benefit of alternative resections with reference to pneumonectomy/lobectomy • Explain risk/benefit of multidisciplinary treatment to patients and family • Communicate in a clear and understandable manner with nursing staff on difficult issues • Explain risk/benefit of multidisciplinary treatment to patients and family • Demonstrate awareness of moral perspectives or religious beliefs that patients/families and / or colleagues hold/believe • Act in a manner that is respectful of the patients' rights, privacy, condition, capabilities	• Attend conference on current guidelines on surgical treatment for lung cancer • Attend a post-graduate course on thoracic oncology • Discuss options with peers at MDT	• CBD • MiniCEX	42	• Attend a seminar on surgical principles of thoracic oncology • Attend 5 surgical operations as observer • Present 5 cases of potentially resectable cases • Judge completeness of resection of 5 cases in operative and postoperative TNM
2 Indications, contraindications and perioperative care for thoracic surgery	• Review tissue diagnosis of lung cancer • Discuss staging • Discuss different tests for evaluation of functional fitness and their respective indications • List various screening tests for cardiovascular and other comorbidities • Describe how to improve fitness and how to treat comorbidities	• Evaluate nutritional and performance status of patient • Conduct surgical risk assessment such as morbidity, mortality, QOL • Interpret functional tests • Interpret bronchoscopy report • Interpret results of pathological samples • Interpret imaging & staging procedures • Conduct final operability assessment • Obtain informed consent		• Case-based discussion in the management of a patient with locoregional extent • Case-based discussion in the management of a patient with associated ischemic heart disease • Discussion on international guidelines on assessment of fitness, assessment of cardiac risk and staging	• Audit • Portfolio • Case-based discussion	4	• Present and discuss at least 5 patients with marginally resectable lung cancer during MDT
3 Surgical techniques	• Explain the differences between thoracotomy and VATS including their impact on postoperative recovery and complications • Explain the basic principles of chest drainage • Compare different types of extended resections	• Describe follow-up and care for patients according to surgical approach (thoracotomy, VATS) • Describe how to follow and manage chest tubes • Identify abnormalities of chest drainage (prolonged airleak, bleeding, chylothorax)		• Discuss at rounds with peers • Case-based discussion with thoracic surgeon on the management of a patient with chylothorax after chest drainage • Observe in the operating room (at least 5 operations)	• Portfolio • Oral exam • Audit	3	• Participate in ward rounds in the surgical unit for at least 10 times
4 Alternatives to lobectomy and pneumonectomy	• Describe when to perform a sleeve lobectomy • Explain when to perform lobectomy with reconstruction of the pulmonary artery • Describe when to perform a sublobar resection • Describe risk and benefits of sleeve lobectomy	• Evaluate feasibility of sleeve lobectomy and sublobar lobectomy • Identify patients benefitting more with alternative procedures		• Case based discussion of management of a patient with a carcinoid tumour of the right upper lobe take-off • Case based discussion of management of a patient with a tumour of the left upper lobe with partial infiltration of the pulmonary artery	• Portfolio • Oral exam • CBD	43	• Participate in the discussion of 5 cases of sleeve lobectomy or sublobar lobectomy in MDT • Present at the MDT conference 1 case of each sleeve lobectomy and sublobar resection

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
	• Describe risks and benefits of sublobar resection			• Case based discussion of management of a patient with peripheral T1N0 tumour in the apical segment of the left lower lobe • Discuss with peers at MDT or during daily rounds			
5 Surgery in the context of multi-modality treatment	• Discuss different schemes for neo-adjuvant and adjuvant treatment • Measure respective value of (neo)adjuvant chemo and/or radiation therapy • Appraise indications/guidelines for multidisciplinary treatment • Estimate long-term prognosis	• Measure impact of (neo)-adjuvant therapies onto surgical outcomes • Choose appropriate treatment schedule for an individual patient • Perform surgical risk assessment with reference to the regimen of treatment		• Case based discussion of management of a patient with single-stage N2 • Case based discussion of management of a patient with Pancoast tumour • Case-based discussion of post-operative management of a patient with pT2N1	• Audit • Portfolio • CBD • Oral exam	4	• Present at the MDT least 5 patient files with indication for neo adjuvant and adjuvant therapies
6 Palliative surgical procedures	• Discuss Talc pleurodesis • Describe indications and modalities of pericardial drainage • Appraise indications for a palliative resection (septic lung abscess, bleeding, etc) • Describe post-op care after pericardial drainage or talc pleurodesis	• Explain how to select patients for efficient talc pleurodesis • Recognize trapped lung • Measure risk/benefit ratio of a palliative major lung resection		• Case based discussion of a stage 4 patient with potentially resectable primary site and massive haemoptysis • Case based discussion of a patient with pleural carcinomatosis and recurrent effusion • Case based discussion of a patient with lung cancer and sudden tamponade.	• Portfolio • Case-based discussion • DOPS	4	• Observe at least 5 patients of this category on the ward • Present 3 patients of this category at MDT
7 Surgery for synchronous and metachronous cancers	• Recall definitions of synchronous and metachronous cancers • Propose differential diagnosis with metastases from other primary tumors than the lung itself • Appraise natural history • Estimate prognosis	• Assess resectability/operability of multiple primary tumours		• Case based discussion of a patient with previous left pneumonectomy and current cT1N0 in the right middle lobe • Case based discussion of a patient with bilateral upper lobe T1-2 N0 tumours • Discussion with peers at MDT	• Case-based discussion • MiniCEX • Oral exam	3	• Participate in MDT discussion of at least 3 cases of this category
8 Surgery for oligo-metastatic lung cancer	• Recall definition of oligometastatic lung cancer • Appraise natural history and prognosis after resection • Define multimodal treatment	• Assess resectability • Organise treatment strategy and schedule in a patient with oligometastatic lung cancer		• Case based discussion of a patient with lung tumour and single brain met • Case based discussion of a patient with lung tumour and single adrenal met • Discussion with peers at MDT	• Case-based discussion • Oral exam	2	• Present at least 1 case of this category at MDT

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
9 Diagnostic, curative and palliative surgery for mediastinal tumours	• Review histologic diagnosis of mediastinal tumours with reference to their location • List histologic classification and staging for thymomas • List different categories of germ cell tumours • List the most frequent varieties of mediastinal lymphomas • Discuss diagnosis and management of neurogenic tumours • Present diagnostic algorithm for mediastinal lymphadenopathies • Discuss diagnosis of mediastinal cysts • Describe diagnostic algorithm of anterior mediastinal tumours • Recall respective diagnostic value of needle biopsy, EBUS, mediastinoscopy/mediastinotomy, VATS • Explain principles of multimodality treatment • Recognise indication for multimodality treatment • Recall basic principles of resection of an anterior mediastinal tumour including extended resections • State indications for palliative tracheobronchial, esophageal and vascular stenting • Construct diagnostic hypothesis in relation with location of the tumour • Set indication for mediastinoscopy/VATS • Recognize indication and approach for mediastinal biopsy	• Recognise “false tumours” such as intrathoracic goiter, hiatal hernia, aortic aneurysm • Execute diagnostic strategy of a mediastinal mass • Assess resectability of a mediastinal tumour		• Case based discussion of differential diagnosis in a patient with an anterior mediastinal mass • Case based discussion of differential diagnosis in a patient with enlarged mediastinal lymph nodes • Case based discussion of “false tumours” such as intrathoracic goiter, hiatal hernia, aortic aneurysm on case reports • Guidelines for treatment of thymomas • Read case reports	• Case-based discussion • MiniCEX • Oral examination		• Discuss at least3 cases of mediastinal tumours in MDT • See at least 6 patients of this category with various diagnoses (making informal)

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
10 Surgery of malignant mesothelioma	• Explain histologic classification and staging of mesothelioma • Explain natural history and prognosis • Discuss indications of palliative procedures such as talc pleurodesis • Recall indications of curative operations such as extended pleuropneumonectomy or extended pleurectomy/decortication • Compare indications of (neo)adjuvant radiation and chemotherapy • Recall regulations of recognition of professional disease • Discuss risk-benefit of operations with curative intent • Discuss long-term results of different treatments	• Assess resectability • Assess operability • Execute selection for talc pleurodesis		• Case based discussion of a patient with recurrent pleural effusion • Case based discussion of a patient with non-bulky mesothelioma without comorbidity/excellent PS • Read review articles	• Case-based discussion • Portfolio • Oral examination		• Attend MDT where at least 3 cases are presented at MDT
11 Pulmonary metastases from other sites and its management	• Recall natural history of the main varieties of extrathoracic cancer (ex colorectal, renal, mammary gland, soft tissue sarcoma, osteogenic sarcoma, etc) • Review outcome after resection of pulmonary metastases / impact of resection/predictive factors • Evaluate sensitivity of extrathoracic tumours to chemotherapy, immunotherapy, hormonotherapy and targeted therapies • Estimate prognosis • Discuss indication of resection in the context of a multidisciplinary approach in each category of tumour	• Assess operability in a patient with lung metastases of an extrathoracic cancer • Assess surgical approach (sternotomy, VATS, thoracotomy) and type of resection (wedge, segmentectomy, lobectomy, pneumonectomy)		• Case based discussion of differential diagnosis between primary bronchial cancer and solitary metastasis in patients with history of extrathoracic malignancy • Case based discussion of sensitivity of non-surgical treatments and risk-benefit ratio of surgical resection • Read review articles	• Case-based discussion • Oral examination		• Attend MDT where at least 5 patients of this category are discussed in MDT

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 11: Management of surgical complications							
Module Competency:	The learner will be able to negotiate overlapping and shared responsibilities in the management of surgical complications with thoracic surgeons and other colleagues in the multi-disciplinary team.						
1 Pain control after thoracic operations	• Compare pain medications (level 1-2-3) • Discuss epidural analgesia • Discuss patient-controlled analgesia	• Choose adequate pain treatment with reference to the type of surgery • Recognise side effects and prescribe appropriate supportive care	• Explain treatment modalities, expected results and possible side effects to the patient and relatives • Communicate with the nursing staff in a clear and effective manner • Explain preventive measures such as weaning from tobacco and preoperative physiotherapy or postoperative NIV • Explain treatment modalities in case of pneumonia • Explain necessity of reintubation for ventilatory support • Explain necessity for bronchoscopy, tube insertion or re-operation to patient and relatives, and to nursing staff • Communicate in a clear and understandable manner with patient during daily rounds • Explain additive interventions • Communicate with patient and relatives in an emergency situation in a sensitive and clear manner • Communicate in a clear and understandable manner with colleagues and nurses • Self-control in the operating room in a high-stress situation • Explain cardiac complications and management to patient and relatives in a clear and sensitive manner • Explain side-effects of medications/techniques • Refer to the pain clinic when required • Accept the need for self-directed learning • Work in a collaborative manner with the multi-disciplinary-team • Obtain a valid consent from	• Read a review article on pain management • Attend a seminar dedicated to pain management • Case based discussion of a patient having undergone thoracotomy	• DOPS • MSF • MiniCEX • Audit	4	• See at least 10 different patients on a surgical ward
2 Post-operative pneumonia: diagnosis, treatment and prevention	• Recall diagnosis of post-operative pneumonia : clinical, radiological and biological criteria • State principles of antibiotic therapy (community acquired/hospital acquired) • Discuss prevention of post-operative pneumonia • Critique treatment options for sputum retention • List diagnostic criteria for respiratory failure	• Secure microbiologic documentation • Diagnose pneumonia • Choose antibiotics with sound argumentation • Investigate optimisation of prophylaxis • Recognise criteria for reintubation • Recognise different methods for bronchial toilet (naso-tracheal aspiration, bronchoscopic aspiration)		• Read a review article • Case based discussion of a patient with pneumonia after lobectomy • Case based discussion of a patient with respiratory failure 4 days after pneumonectomy	• MiniCEX • CBD • Audit	4	
3 Empyema and bronchial fistula after pneumonectomy/lobectomy	• Summarise pathogenesis of empyema/fistula • Review criteria for early diagnosis of empyema/fistula • Recall principles of management of empyema/fistula after lobectomy • Recall principles of management of empyema/fistula after pneumonectomy • List indication for tube insertion	• Diagnose empyema/fistula • Prescribe care for thoracostomy • Recognise the difference of severity of bronchopleural fistula according to partial or total lung resection		• Case based discussion of a patient with post-operative empyema and/or bronchial fistula • Attend staff meeting dedicated to post-operative complications (morbidy/mortality rounds) • Read a review article	• CBD • Audit	4	• See and follow at least 1 surgical case in a surgical ward or ICU
4 Prolonged airleak	• Recall definition of airleak • Explain causes of airleak • Analyse management of airleak • Describe different drainage systems (Pleurevac, Topaz, Heimlich valve)	• Conduct surveillance and management of chest drainage • Wean the patient from his chest tube		• Case based discussion of a patient with prolonged air leak without residual space • Case based discussion of a patient with prolonged air leak with residual space • Case based discussion on dysfunction of drainage systems	• CBD • Simulation • Audit	4	• Participate in the management of at least 5 patients with prolonged air leak on the surgical ward

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
5 Post-operative bleeding	• Define perioperative coagulation disorders • Discuss main causes for post-op bleeding • Analyse criteria for reoperation • Recall principles of management in the ICU	• Recognise coagulation disorder and prescribe correction • Hypothesize origin of bleeding in a given situation • Decide adequately for exploration • Coordinate intensive care	patients or acts appropriately if consent is withheld or cannot be obtained	• Case based discussion on management of a patient with moderate bleeding around 100 mL/hour • Case based discussion on management of patient with intense bleeding with CV collapse	• CBD • Audit • Mini CEX	4	• See at least 3 patients on a surgical ward or ICU
6 Acute Respiratory Distress Syndrome (ARDS)	• Recall definition of ARDS • State principles of conventional management (protective ventilation, permissive hypercarbia, positioning) • Discuss indications for ECMO • Describe management of ECMO	• Recognise ARDS • Recognise indication for ECMO and follow-up the patient • Decide weaning from ECMO		• Case based discussion of a patient with ARDS after pneumonectomy	• CBD • Mini CEX	4	• See at least 1 patient in the ICU
7 Cardiac complications after surgery: infarction, arrhythmia	• Review diagnosis of postoperative ischemia/infarction • Appraise management of post-operative ischemia/infarction • Appraise management of postoperative supraventricular • Categorise diagnosis and treatment of the different types of tachycardia • Review prevention of post-operative cardiac adverse events • Describe prevention of thromboembolism • Review diagnosis of pulmonary embolism	• Diagnose post-operative ischemia/infarction • Manage post-operative tachycardia • Manage patient with known significant coronary disease perioperatively • Plan prevention of thromboembolism • Diagnose pulmonary embolism		• Case based discussion of a patient with supraventricular tachycardia • Case based discussion for management of a post-operative infarction • Case based discussion for management of a post-operative pulmonary embolism	• CBD • Audit	4	• Having seen at least 3 such patients on the surgical ward or ICU
8 Chronic pain after thoracotomy	• Recall mechanisms • Compare treatments	• Conduct differential diagnosis between causalgia and neuroma • Choose and prescribe treatments of chronic pain		• Listen to a lecture on chronic pain • Read a review article • Discuss with a peer from pain clinic	• CBD • Oral examination • Mini CEX	4	• Having seen at least 5 patients on an outpatient basis
9 Chronic complications after pneumonectomy	• Describe post-pneumonectomy syndrome • Discuss reopened foramen ovale • Illustrate esophagopleural fistula • Describe restrictive respiratory failure	• Diagnose post-pneumonectomy syndrome • Diagnose reopened formen ovale • Diagnose esophagopleural fistula • Explore chronic respiratory failure		• Read case reports and discuss them with peers at the journal club	• CBD • Oral examination • Mini CEX	2	• Clinical exposure is not guaranteed during training • These exceptional situations should be addressed in discussion with a senior consultant in thoracic surgery

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
10 Other chronic complications	• List causes of chylothorax	• Explain diagnosis of chylothorax • Explain principles of treatment of chylothorax • Explain principles of treatment of postop chest wall complications • Recognize chest wall complications (rupture of intercostal sutures, intercostal hernia after VATS, MI cardiac interventions, sternitis/osteochondritis)		• Read review article • Discuss case reports with peers at the journal club	• CBD • Oral examination • Mini CEX	2	• Case based discussion with peers
Module 12: Principles of radiation therapy							
Module Competency:	The learner will be able to engage in respectful shared decision-making with radiation oncologists and other colleagues in the multidisciplinary to team regarding the role, appropriate administration and side effects of radiotherapy in thoracic malignancies						
1 Radiotherapy planning and techniques	• Review the basic principles of radiation physics (ionizing radiation: photons, electrons and heavy particles) • Explain the radio-biological principles of RT • Describe imaging for radiotherapy • Describe the setup/positioning for RT • Describe basic radiotherapy techniques (2D, 3D, IMRT, VMAT, SBRT) • Recall the principles behind dose volume histograms • Recall the principle of motion management in radiotherapy (4D CT) • Identify the principles of radiation protection in daily practice	• Present imaging for radiotherapy planning in appropriate patients • Interpret a radiotherapy plan • Assess different radiotherapy techniques • Combine dose volume histogram information with expected toxicity in the radiotherapy planning	• Demonstrate awareness of the basics of radiation protection and potential secondary malignancy • Demonstrate active listening and appreciation of concerns of patients regarding the technology	• Reading an introductory chapter or review on radiotherapy principles	• MCQ • CBD • Short Answered Question (SAQ)	2	• Attend the planning and process of at least 10 radiotherapy treatments
2 Indications and contraindications for radiotherapy	• Review indications: • - SBRT for early stage • - Adjuvant and neo-adjuvant radiotherapy • - Radical and palliative setting • Review absolute and relative contraindications	• Identify disease situations not suitable or favorable to radiotherapy	• Assist the patient and relatives to understand the radiotherapy process • Communicate in a clear and understandable manner for patients and relatives the reasons for or against excluding a radiotherapy approach • Examine lung function with respect to radiotherapy planning	• Read a review article on contraindication in radiotherapy	• Case based discussion • SAQ • MCQ	2	• Discuss 5 cases in the MDT Discussion with peers at MDT
3 Thoracic radiotherapy with curative intent for lung cancer	• Describe appropriate stages for curative (chemo)radiotherapy in locally advanced lung cancer (Refer to Module 15 see other	• Identify patients eligible for curative (chemo)radiotherapy • Discuss alternative strategies if	• Discuss with patient and relatives the risks and benefits of (chemo)radiotherapy and alternative strategies	• Case-based discussion of a chemoradiotherapy of a Stage IIIA lung cancer	• CBD • SAQ • MCQ	2	• Attend the planning and process of at least 5 chemoradiotherapy treatments

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
	module) • Recognise heterogeneity of N2 stages • State the principles of dosing, timing and fractionations of RT • Describe situations that are appropriate for single modality radiotherapy treatment • Explain the principles of adjuvant radiotherapy (Refer to module 15) • Discuss the advantages and risks of more radical approaches in oligometastastic disease	available • Discuss the potential benefits and risks of a curative approach in oligo-metastatic disease		• Reading most relevant literature			• Presenting 5 radiotherapy cases at the MDT
4 Thoracic palliative radiotherapy (move to number 6 before stereotactic ablative therapy)	• List potential indications for palliative radiotherapy • Explain principles of dose and fractionation in palliative setting	• Identify patients for palliative treatment • Examine alternative treatments	• Offer patients a balanced information about the expected benefits and toxicities from palliative radiation	• Reading most relevant literature	• Case based discussion • SAQ • MCQ	2	• Presenting 5 radiotherapy cases at the MDT
5 Prophylactic, and palliative cranial irradiation	• Outline indications for PCI • State the indications for palliative whole brain radiotherapy RT • Recount radio-therapeutic approaches to WBRT • List Side effects / neuro-cognitive function • Discuss QOL in prophylactic, and palliative cranial irradiation	• Select patients with SCLC for PCI • Explain to patients the potential advantages and disadvantages of PCI • Organise interdisciplinary evaluation of brain metastases and management	• Demonstrate awareness of the worries and concerns of patients	• Case-based discussion of a chemoradiotherapy of a Stage IIIA lung cancer • Reading most relevant literature	• Case based discussion • SAQ • MCQ	2	• Presenting 5 radiotherapy cases at the MDT • Presenting 5 radiotherapy cases at the MDT
6 Stereotactic ablative radiosurgery / radiotherapy	• List indications for stereotactic radiotherapy • Discuss use of stereotactic ablative radiosurgery for single pulmonary metastases, Stage I lung cancer • Name prerequisites for stereotactic radiotherapy treatment: Lung function parameters • Discuss fractionation regimes • Review surgical alternatives • Describe principles of Radiosurgery/SBRT for brain metastases • Explain neurosurgical alternatives or treatment combinations	• Select patients for stereotactic radiotherapy treatment • Prepare relevant information for treatment decision • Ensure follow-up for patient undergoing stereotactic radiotherapy treatment	• Demonstrate openness to alternative treatment approaches	• Visiting a Radiation Oncology Department performing stereotactic radiotherapy treatment • Follow patients undergoing palliative radiotherapy	• Case based discussion • SAQ • MCQ	2	• Visit radiation oncology department and discuss which techniques are offered
7 Palliative radiotherapy for other metastatic sites	• Explain Indications for extrathoracic palliative radiotherapy	• Coordinate interdisciplinary management of extra-thoracic metastases	• Balance and manage different treatments while considering the quality of life of the patient		• Case based discussion • SAQ • MCQ	2	• Follow at least 5 patients undergoing palliative radiotherapy and discuss these patients in an interdisciplinary setting (MDT)

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
8 Radiotherapy for mesothelioma (Refer to Module 15)	• Discuss postoperative RT after extra-pleural pneumonectomy • Review different techniques of irradiation • Explain the role of radiotherapy in mesothelioma	• Identify patients for adjuvant radiotherapy	• Approach a patient with a solid understanding of data where available and be able to openly discuss all treatment options, including best supportive care	• Case-based discussion of mesothelioma cases undergoing RT in your center, understanding how and why these patients were treated	• Case based discussion • SAQ • MCQ	2	• Discuss 3 cases at the MDT of mesothelioma
9 Radiotherapy for mediastinal tumours	• Discuss treatment strategies of unresectable thymoma • List potential indications of radiotherapy for thymoma and other mediastinal tumours	• Select patients for radical and adjuvant approaches	• Balance and manage different treatments while considering the quality of life of the patient	• Case-based discussion of thymoma and thymic carcinoma undergoing RT in your center, understanding how and why these patients were treated	• Case based discussion • SAQ • MCQ	2	• Discuss 3 cases at the MDT
10 Management of side effects	• Recall grading and scoring and toxicities (Refer to module on this) • Recall the management approaches of side effects • Radiation induced Pneumonitis • Oesophagitis • Cardiac toxicity • Tracheal complications • Skin reactions • Secondary malignancy	• Assess risk of radiation induced toxicities by dose volume histogram parameters • Treat radiation induced pneumonitis • Treat oesophagitis • Treat skin reactions	• Discuss with patient and relatives side effects • Explain side effects and potential treatments to patients	• Follow-up inpatients with toxicity	• Short case • OSCE (Objective structured clinical examination)	3	• Follow at least 10 patients undergoing radiotherapy

Module 13: Principles of systemic therapy							
Module Competency:	The learner will be able to engage in respectful shared decision-making with colleagues in the multi-disciplinary team regarding systemic therapy and participating in the management of specific patients.						
1 Basis of cytotoxic therapy 2 Basis of biological /targeted therapy	• Classify drug types • Explain mechanisms of action • Describe the pharmacology including dosage and dose modification criteria (renal, hepatic, myelosuppresion) • Describe the pharmacokinetics • Describe drug toxicity • List predictive factors of response	• Assess appropriate tests to determine whether dose modification is needed • Compare the difference between MAb and TKI • Explain the different pathways in treatment decisions • Demonstrate awareness of pharmacokinetics in treatment decisions • Modify dose appropriately when needed	• Demonstrate up to date knowledge in basic pharmacology mechanisms and mode of action of available treatments	• Reading and reviewing content in relevant textbooks • Relevant CME-accredited learning seminars • Reading up to date literature	• MCQ	1	• Attendance to a CME-accredited post-graduate course
3 Indications and contraindications for systemic therapy including chemotherapy and targeted agents	• Ascertain indications according to stage, histology, and molecular alterations in consideration of the types of drugs • Ascertain contraindications related to comorbidities, age, poor performance status in consideration of the types of drugs • First-line therapy - Appraise choice of the	• Decide treatment taking into consideration benefit and cost/toxicity for the patient • Personalise the drug regimen appropriate to the patient and his/her tumour • Personalise the drug regimen appropriate to the patient and his/her tumour • Manage the course of the treatment according to	• Communicate relevant information to patient and family regarding indication, potential benefit and side effects, administration modalities • Balance risk-benefit ratio • Communicate trial results with patients • Demonstrate interest and support by staying up to date on phase III trials including conduct,	• Case-based discussion of the management of a patient with NSCLC and pleural invasion	• Case-based discussion	2	• Discuss 40 cases at MDT

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
	regimen according to the level of evidence - Consider predictive factors (histology, genetic alterations, etc.) - Adapt therapy according to absolute or relative contra-indications	tolerance and complications	recruitment etc				
4 Non-small cell lung carcinoma(NSCLC)	• Second line therapy - Appraise choice of the regimen according to the level of evidence - Consider predictor factors (histology, genetic alterations, etc.) - Adapt therapy according to absolute or relative contra-indications • Further lines of treatment - Appraise choice of the regimen according to the level of evidence - Consider predictor factors (histology, genetic alterations, etc.) - Adapt therapy according to absolute or relative contra-indications		• Communicate relevant information to patient and family regarding indication, potential benefits, side effects, and administration modalities	• Case-based discussion of the management of a patient with stage IV NSCLC			• Participate in the management of at least 5 cases
5 Small cell lung cancer (SCLC)				• Case-based discussion of the management of a patient with extensive disease SCLC			• Participate in the management of at least 10 cases
6 mesothelioma				• Case-based discussion of the management of a patient with mesothelioma			• Participate in the management of at least 5 cases
7 mediastinal tumours				• Case-based discussion of the management of a patient with mediastinal tumour			• Participate in the management of at least 3 cases

Module 14: Side effects of systemic therapy and their management							
Module Competency:	The learner will be able to negotiate overlapping and shared responsibilities with other colleagues in the recognition and management of the side effects of systemic therapy.						
1 Quantification of side effects	• Define, describe and grade toxicity of systemic therapy • Discuss management of the side effects • Discuss adaptation of the anticancer treatment to the toxicity	• Identify and assess toxicity of systemic therapy • Determine grade of side effects • Adapt anticancer treatment to the specific situation of the patient regarding observed toxicity	• Communicate relevant information with patient and family regarding toxicities • Attend seminars/workshops on systemic therapy • Demonstrate the awareness of moral perspectives or religious	• Case-based discussion of the management of a patient with SCLC and febrile neutropenia	• Case-based discussion • MCQ	2	• Observe grading and management of at least 10 cases of cytotoxic chemotherapy and targeted treatment side effects

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Side effects of chaemotherapy	• Discuss the pathophysiology of the following side effects: • Haematological side effects: Neutropenia, febrile neutropenia, anaemia and thrombopenia • Mucositis/oesophagitis • Alopecia and dermatological toxicity • Nausea, vomiting and diarrhea • Neurotoxicity • Ototoxicity • Hepatic toxicity • Nephrotoxicity • Cardiovascular toxicity • Extravasation • Infertility and teratogenesis • Electrolyte imbalance		beliefs that patients/families and/or colleagues hold/believe • Obtain valid consent from the patient or act appropriately if consent is withheld or cannot be obtained • Be aware and Instigate local procedures and policies for patients that lack capacity to consent, retain information and understand • Notify to the pharmacovigilance authorities any new side effects	• Case-based discussion of the management of a patient with NSCLC and vomiting			
3 Side effects of molecular therapy	• Discuss the pathophysiology of the following side effects: - Dermatological toxicity - Diarrhea - Hepatic toxicity - Cardiovascular toxicity - Pulmonary toxicity - Nephrotoxicity			• Case-based discussion of the management of a patient with adenocarcinoma treated by TKI and present with diarrhea			

Module 15: Combined modality treatments							
Module Competency:	The learner will be able to perform a patient-centred clinical assessment and establish a multimodality management plan for different types, stages and presentations of lung cancers						
1 Adjuvant chemotherapy for early NSCLC	• Discuss the benefit of adjuvant chemotherapy • Identify different chemotherapy doses and schedules • Outline the expected compliance and common toxicities • Discuss outcomes and quality of life	• Estimate the survival benefit of adjuvant chemotherapy in different stages of NSCLC • Demonstrate when adjuvant chemotherapy prescription needs to be done • Estimate outcomes and quality of life for all patients • Identify haematological and non-haematological side effects and refer accordingly • Estimate general condition of an elderly patient according to simple geriatric assessment scales	• Recognise pros and cons of treatment modalities and balance with all other available options • Inform patient and relatives regarding benefits and risks of treatment modalities • Communicate with medical and nursing staff to strictly monitor patients in particular clinical conditions • Collaborate with physicists and technicians staff to establish the most accurate radiotherapy treatment modality (e.g.	• Read a systematic review article on adjuvant chemotherapy treatment • Case-based discussion of a patient with NSCLC pT2N1	• Case-based discussion • SAQ • MCQ	2	• Discuss at least 15 cases with lung cancers considered for combined modality treatment including adjuvant and neodjuvant approaches • Discuss at least 2 cases of mesothelioma

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Adjuvant radiotherapy in resected N2 NSCLC	• Analyse the role of adjuvant radiation treatment in resected pN2 • Describe target volume in adjuvant radiotherapy setting according to risk factors (such as location, nodal status, etc.) • Discuss non-haematological toxicities • Describe the principles of generating target volume contour for adjuvant radiotherapy treatment	• Estimate the benefit of adjuvant radiotherapy • Examine an adjuvant radiation therapy prescription • Present the role of dosimetric parameters to predict non-haematological toxicity • Estimate general condition of an elderly patient according to simple geriatric assessment scales	simulation, dose distribution) • Accept the need for self-directed learning • Embrace opportunities to accept peer review and feedback from colleagues	• Read a review article on adjuvant radiation therapy • Case-based discussion of a patient with NSCLC pT2N2 with station 4R and 7 positive at surgery	• Case-based discussion • SAQ • MCQ	2	
3 Neo-adjuvant approach for NSCLC (Refer to thoracic surgery module)	• Summarise general principles of a neo-adjuvant approach: - downsizing - downstaging - resection rate - complications • Discuss the surgical approach and its sequelae after an induction treatment	• Identify the most appropriate approach (chemotherapy or chemoradiation) according to the patient's clinical condition and the expected toxicities • Examine target volumes and organs at risk doses for radiation treatment in a neo-adjuvant setting • Examine the chemotherapy prescription delivered exclusively or concurrently to radiotherapy • Identify haematological and non-haematological toxicities of a neoadjuvant approach • Estimate resectability after neo-adjuvant treatment • Estimate general condition of an elderly patient according to simple geriatric assessment scales			• Case-based discussion • SAQ • MCQ	2	

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
4 Combined radio-chemotherapy for locally advanced NSCLC	• Illustrate the role of induction and consolidation chaemotherapy to concurrent chaemoradiation • Discuss haematological and non-haematological toxicities of the integrated approach • Illustrate the principles of therapy for the most important side effects (esophagitis, infective and actinic pneumonitis, pancytopenia, etc.)	• Arrange a treatment strategy according to the patient's age and performance status • Examine target volumes and organs at risk doses for radiation treatment in a radical setting • Examine the chemotherapy prescription delivered concurrently or sequentially to radiotherapy • Estimate toxicities according to dosimetric constraints and patient's clinical condition • Estimate general condition of an elderly patient according to simple geriatric assessment scales			• Case-based discussion • SAQ • MCQ	2	• Present at least 15 cases treated with combined radio-chemotherapy (in total with Module 12)
5 Combined radio-chemotherapy for SCLC	• Discuss the "timing question" (when integrating radiotherapy to chemotherapy) in treatment of limited SCLC • Discuss the principles of establishing total dose and fractionation for a radiotherapy treatment with curative intent • Review concomitant systemic treatment • Discuss the role of prophylactic cranial irradiation (PCI) • Discuss existing evidence and controversies on potential benefit of thoracic radiotherapy for extended SCLC	• Arrange the appropriate timing of a concomitant treatment • Examine target volumes and organs at risk for radiation treatment on the basis of diagnostic exams (CT, PET-CT, etc) • Measure benefits/risks of PCI • Estimate toxicities according to dosimetric constraints and patient's clinical condition			• Case-based discussion • SAQ • MCQ	2	• Discuss for eligibility for at least 5 cases for combined radio-chemotherapy
6 Combined treatment for mesothelioma	• Review the benefit/risk of the combined approach • Review the principles and the different types of surgery • Describe chaemotherapy regimens recommended for treatment • Discriminate the radiation therapy modalities to approach the disease	• Identify the right patient for the tri-modality approach (chemotherapy, surgery and radiotherapy) • Estimate prognosis • Examine the cardio-pulmonary function to be eligible for a major surgery			• Oral exams • Case-based discussion • SAQ • MCQ	2	• Present 3-5 cases with mesothelioma treated with palliative or radical intent

Module 16: Management of particular groups of patients							
Module Competency:	The learner is able to perform a patient-centred clinical assessment and establish a management plan specific for various particular groups of lung cancer patients.						
1 Elderly	• Define each particular group of	• Clinical evaluation of each	• Discuss the particular case with	• Case-based discussion on the	• Case-based discussion	4	• Participate in the

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Poor performance status patient 3 Unfit patients due to comorbidities 4 Patients with HIV 5 Preneoplastic and preinvasive lesions 6 Synchronous, metachronous lung tumours 7 Oligometastatic disease 8 Patients with brain metastases 9 Ischaemic heart disease in potentially operable patients 10 Atherosclerosis of carotid vessels in the surgical patient 11 Strategy in patients with combined lung and extra-thoracic malignancies (head & neck, bladder, colon, kidney, breast, etc)	patients • Identify risks related to the particular situation • Discuss therapeutic implications of each particular situation	particular patient • Adapt treatment to the situation • Manage toxicity in the specific context	the MDT • Explain in a clear and sensitive manner the particular situation to the patient and family • Identify areas of academic or professional limitation and utilise the expertise of other professionals and experts as appropriate • Work in a collaborative manner with the MDT • Mentor junior members of the healthcare team when appropriate • Act in a manner that is respectful of the patients' rights, privacy, condition or capabilities • Obtain a valid consent from patient • Act appropriately if consent is withheld or cannot be obtained due to lack of capacity of the patient to give consent to treatments/diagnostic procedures, to understand and retain information. • Participate in best of interest meetings between all parties involved in patient care including the patient's family	management of lung cancer in each of the particular group of patients	• Portfolio		management of a minimum of 5 cases • Participate in the management of a minimum of 5 cases • Participate in the management of a minimum of 5 cases (patients with comorbidities and HIV) • Participate in the management of 5 cases • Participate in the management of 5 cases • Participate in the management of 5 cases • Participate in the management of a minimum of10 cases • Participate in the management of 5 cases • Participate in the management of 5 cases • Participate in the management of 5 cases

Module 17: Treatment evaluation and follow-up							
Module Competency:	The learner will be able to implement a patient-centred care plan that supports ongoing care, follow-up on investigations, response to treatment, and further consultation. The learner will be able to evaluate the impact of oncological treatment to disease type, survival, quality of life.						
1 Survival / Progression-free survival	• Explain definitions of overall survival (OS) and progression free survival (PFS)	• Critical analysis of statistics and trials about OS and PFS and applicability of these results in clinical practice	• Communicate in a clear manner with patient and family on the risks of progression after response and life expectancy • Communicate in a clear and sensitive manner with patient and family about the results of therapy • Discuss with patient about the frequency of response	• Discussion with a patient of the expectancies in terms of treatment results, future tumour evolution and realistic quantification of life expectancy	• Short case • MCQ • Oral Examination	3	• Analyse at least 10 papers in terms of survival analysis

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Response assessment	• Recall criteria for specific response evaluation in cases of response to targeted therapy (for example as defined by Response evaluation criteria in solid tumours (RECIST) 1.0 and 1.1 for lung cancers as well as modified RECIST criteria for mesothelioma) • Discuss measurable and evaluable disease • Recall definition of response rate, stable disease control and progressive disease • Define definition of target and non target lesions • Appraise actual recommendations about the use of tumour markers in lung cancer patients • Analyse utility of tumour markers in diagnosis, prognosis, and follow-up in mediastinal tumours • Illustrate acute and late effects of radiation therapy and possible misinterpretation in progressive disease	• Choose the best evaluation imaging modality depending on the lesion • Interpret CT and MRI images • Identify measurable disease • Choose target and non-target lesions	evaluation and its utility • Explain to the patient available options for surveillance and opportunities for future interventions • Recognise limitations in knowledge for establishing evidence based protocols • Demonstrate empathy towards the patient and his family • Demonstrate proactive attitude towards early recognition of symptoms • Act in a manner that is respectful of the patients' rights, privacy, condition and capabilities	• Clinical Case review	• MCQ • Oral examination • CBD	2	• Assist in at least 30 evaluation of response to therapy
3 Other surrogate endpoints	• Discuss potential secondary measures for evaluation such as: time to response, duration of response, duration of disease control, time to progressive disease, time to treat failure • Analyse the risk of treatment-induced cancers (including haematologic malignancies), after chemotherapy, and radiation induced sarcomas • Discuss respiratory function prediction after surgery	• Recognise the variability of endpoint definitions		• Discussion with a patient about expectancies in terms of treatment results, future tumour evolution and realistic quantification of life expectancy	• MCQ	2	• Analysis of at least 10 papers and critically assess their use of the different survival definitions
4 Quality of life (QoL) /Symptom improvement	• Describe tools used to assess quality of life: existing QoL scales concerning general health evaluation and those specific to lung cancer • Review modalities for prevention and treatment (symptomatic) of side effects related to therapy and those related to disease progression	• Apply scales and interpret results • Choose appropriate symptomatic treatment		• Interpretation of self-administered questionnaires	• MCQ • Oral Examination	2	• To apply QoL questionnaires (QLQ-C30/LC-13, LCSS, FACT-L) to at least 10 patients and correlate with clinical outcome.

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
5 Follow-up	• Recall secondary effect of surgery / radiotherapy / chemotherapy • Appraise possible second line/salvage treatment and their effect in term of survival and QoL • Describe available imaging methods for follow up • Review existing limitations in terms of impact of surveillance strategy • Recall current guidelines in terms of post treatment follow-up (ASCO/ESMO, ACCP, British Columbia cancer agency, NICE) • Identify secondary lung cancers and limitations of screening in this situation • List the benefits of smoking cessation and maintenance of abstinence during follow-up	• Create a personalised follow-up plan according to disease type and stage and patient's needs		• Clinical Case Review	• Oral Examination • KF • CBD	2	• Review at least 50 patients followed-up post treatment in an MDT
Module 18: Supportive care							
Module Objective:	The learner is able to negotiate overlapping and shared responsibilities with other colleagues in the multidisciplinary team to provide appropriate supportive care to lung cancer patients with various problems.						
Symptoms control and complications care							
1 Pain management	• Discuss indications and timing for specific management • Recall medications, mode of action, dosing, recommended and non-recommended combinations, side-effects and their management • Discuss principles of palliative radiotherapy • Describe interventional pain management techniques (intrathecal, epidural administration, nerve blocks) • Discuss ablative techniques (radiofrequency, cryoablation) • Compare surgical procedures • Explain biphosphonates • Discuss and list psychosomatic symptoms • Discuss psychological aspects and approaches to pain management in cancer patients	• Conduct physical examination and interpret findings • Manage pain of diverse aetiology (e.g. neuropathic pain, complex regional pain syndrome) • Treat acute as well chronic pain • Select opioids and manage opioid toxicity • Provide end of life care related to pain management	• Accepts the importance of multimodal pain management	• Case-based discussion of the management of a lung cancer patient with bone pain	• Case Based Discussion	2	• Discuss and participate in the management of 20 patients needing supportive care

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Management of dyspnoea and respiratory failure (RF)	• Recall definition, classification and aetiology of acute and chronic dyspnoea and respiratory failure (tumour growth, bronchial/tracheal occlusion, pleural effusion, post-radiotherapy, COPD, infection etc) • Review epidemiology and pathophysiology of RF • Critique relevant investigations: non-invasive (chest x-ray, ultrasound, fluoroscopy, CT, nuclear techniques, pulmonary function tests) and invasive (bronchoscopy) • Discuss relevant therapeutic measures such as oxygen supplementation, systemic/inhaled drug therapy, ventilatory support, endobronchial therapy, intercostal tube drainage)	• Evaluate functional status • Apply oxygen supplementation • Perform interventional techniques (Bronchoscopic: stenting, laser and ablation techniques, thoracentisis) • Select systemic and inhaled drug therapy	• Communicate effectively with patient and/or family on effectiveness and side effects of drug regimen and the risks and benefits of various invasive procedures • Communicate effectively with patient and/or family on the gravity of the syndrome and the possible outcomes • Liaise with MDT to provide prompt management of the symptoms and of the underlying tumour	• Case-based discussion of the management of a lung cancer patient with dyspnoea and respiratory failure			
3 Management of malignant airway obstruction	• State indications for relevant local therapeutic measures such as endobronchial therapy, (stents, tumour debulking with cryoscopy/diathermy/ laser, photodynamic therapy, ablation), radiotherapy/brachytherapy,) and general measures (oxygen supplementation, use of steroids and other systemic/inhaled drug therapy, intercostal tube drainage)	• Identify patients and propose bronchoscopic techniques if appropriate (stenting, laser etc and ablation techniques) • Refer to appropriate specialist • Manage dyspnoea		• Case-based discussion of the management of a lung cancer patient with malignant airway obstruction			
4 Management of superior vena cava syndrome	• Explain use of systemic medications for relief of compression • Discuss indications for RT and systemic chemotherapy, and interventional radiology	• Prescribe systemic decompressing medications • Prescribe chemotherapy or RT or liaising with MDT to provide prompt management		• Case-based discussion of the management of a lung cancer patient with superior vena cava syndrome			
5 Management of paraneoplastic syndromes (PNS)	• Review paraneoplastic syndromes associated with lung cancer (neurological, hormonal/endocrine, haematological and skeletal or mucocutaneous syndromes) • Discuss incidence, pathophysiology and immunopathology of PNSs, occurrence in relation to tumor • Analyse use of symptom relieving medications and strategies e.g. fluid restriction • Analyse use of systemic therapy for the management of the tumor and the PNS	• Recognise PNS • Prescribe systemic medications and instructions for the management of acute or life threatening symptoms (hypercalcemia, hyponatremia) • Prescribe chemotherapy or RT		• Case-based discussion of the management of a lung cancer patient with paraneoplastic syndrome			

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
6 Malignant pleural effusion	• Discuss diagnosis and management of pleural effusion • Compare open and closed thoracostomies • Evaluate systemic treatment • Appraise chemical pleurodesis • Discuss management of comorbid conditions, dyspnoea, hypoxaemia	• Establish diagnosis • Schedule individualised treatment plan, taking into account cancer stage, the patient's prognosis, local availability and experience.		• Case-based discussion of the management of a lung cancer patient with malignant pleural effusion			
7 Malignant pericardial effusion	• Discuss diagnosis and management of pericardial effusion • Illustrate medical and surgical decompressing procedures	• Recognise tamponade/life-threatening effusion • Schedule individualized treatment plan, taking into account cancer stage, the patient's prognosis, local availability and experience. • Diagnose life-threatening effusions		• Case-based discussion of the management of a lung cancer patient with malignant pericardial effusion			
8 Management of bone metastases	• Discuss indications and timing for specific management • Discuss different approaches (radiotherapy, surgical procedures, interventional radiology) to prevent and manage fractures and associated neurological side effects e.g. paraplegia • Review pain relief medications, mode of action, dosing, recommended and non-recommended combinations, side-effects and their management • Assess palliative RT • Compare interventional pain management techniques (intrathecal, epidural administration, nerve blocks)	• Interpret history, examination and physical examination findings • Select opioids and manage opioid toxicity. • Identify lesions that can in the short term predictably fracture joints, or cause catastrophic consequences if fracture occurs and refer for surgical stabilisation		• Case-based discussion of the management of a lung cancer patient with bone metastases			
9 Nutritional support	• Recall principles and evaluation of nutritional status • Discuss nutritional status assessment tools • Appraise the role of nutritional support as an adjuvant to anticancer therapy	• Identify the subset(s) of patients who may benefit from nutritional support • Determine the severity and cause(s) of malnutrition • Identify, using screening tools and indices, patients at risk of complications of chemotherapy, radiation therapy or surgery • Assess the efficacy of nutritional support	• Participate in a team with nutrition specialists • Assess patients' nutritional status upon diagnosis of lung cancer and to follow up during treatment • Communicate effectively with the patient and family regarding outcomes	• Case-based discussion of the management of the nutritional state of a patient under concurrent chemoradiation	• Case Based Discussion • Feedback on letters: assessment instrument for letters	4	

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
10 Intensive care	• List common causes of respiratory failure and need of management in intensive care in this population (coexisting CVDs, pneumonia, sepsis, lung cancer and its typical complications and lung cancer treatments adverse effects) • Recall principles of invasive and non-invasive mechanical ventilation • Recall principles of monitoring in intensive care unit • Analyse factors associated with good or poor outcomes, that can guide the decision of admission in ICU accordingly	• Identify the subset(s) of lung cancer patients who may benefit from management in an intensive care unit and those who would benefit from a decision to be resuscitated should the need arise • Apply and monitor invasive and non-invasive mechanical ventilation • Assess the prognosis of critical illness (and the effect on quality of life) among patients with lung cancer and take the appropriate decisions	• Participate in a multidisciplinary team with anaesthesiologist and intensive care specialist • Involve patients and their family in decisions about intensive care treatment • Consider cost-benefit ratio of intensive care treatment in lung cancer patients	• Case based discussion of the management of a lung cancer patient with ARDS, while on treatment with TKIs	• Case Based Discussion • Oral Examination	2	
11 Indications and management of catheters	• Describe indications and management of catheters in different cancer related conditions • Describe indications, contraindications and risks of vascular access	• Identify the subset(s) of lung cancer patient who may benefit from catheters • Assess risk/benefit and cost/benefit ratio for individual patient and proposed procedure • Schedule individualized treatment plan, taking into account cancer stage, the patient's prognosis, local availability and experience.	• Collaborate with other specialists (e.g interventional radiologists) • Communicate effectively with patient and/or family on risks and benefits of various invasive procedures	• Case-based management of a lung cancer patient with subclavian vein thrombosis	• Case Based Discussion • Objective Structured Clinical Examination	3	
12 Psychological support for the patient and family	• Recall basic principles of psycho-oncology, including communication skills, psychotropic medications and psychological therapies in order to use in routine clinical practice • Appraise psychological needs and support of patient and patients family	• Detect the psychological symptoms and problems in patients with lung cancer • Assess psychological dysfunction (e.g anxiety, depression) and treat accordingly • Use standardised tools (e.g questionnaires) or scales of psychological evaluation in clinical practice • Use psychotropic medications appropriately and continuously evaluate outcomes and possible side effects	• Participate in a multidisciplinary team with other specialists in the specific field (oncology nurse, psychotherapist, psychiatrist) • Accept the importance of good patient-doctor relationship • Demonstrate good medical ethics and kind attitude to patients and their family • Communicate effectively with patient and family on unmet needs and psychological distress symptoms • Communicate in a clear manner with the MDT	• Case-based discussion of the management of a lung cancer patient with major depression	• Case Based Discussion • Objective Structured Clinical Examination • Feedback on letters: assessment instrument for letters	3	• Observe 5 sessions of psycho-oncological consultation
General supportive care							

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
13 Rehabilitation	• List basic principles of rehabilitation programmes • Appraise the role of pre- and post-operative exercise training programmes in lung cancer patients • Explain the differences in underlying respiratory pathophysiology, symptomatology and disease course that may require modification to the standard rehabilitation format.	• Identify the subset(s) of lung cancer patient who may benefit from rehabilitation programs • Assess physical de-conditioning, symptoms of depression and a poor quality of life • Apply exercise training, nutritional and psychosocial counselling, behavioural change, occupational therapy and progressive relaxation techniques in selected patients with lung cancer	• Participate in a multidisciplinary team with other specialists in the specific field (physical therapists, occupational therapists, nutritionists, psychologists, exercise physiologists) • Explain advantages of participating in rehabilitation programs to patient and/or family • Demonstrate awareness of limitations of rehabilitation programs in cancer patients • Monitor and evaluate program outcomes	• Case-based discussion of the management of a lung cancer patient with advanced COPD after lobectomy for lung cancer	• Case Based Discussion	2	• Discuss potential need for rehabilitation
14 End-of-life care	• Discuss principles of end-of-life care planning with patients • Recall principles of patients' rights to self-determination of treatment • Appraise ethical, cultural and religious issues • Discuss other parts of supportive care eg pain and dyspnoea management	• Discuss end-of-life (EOL) care planning with patients who have incurable cancer and a life expectancy of less than one year • Discuss patients preferences for EOL care (e.g palliation over aggressive measures at the EOL, die at home or under hospice care, to receive or not receive life-prolonging care) • Participate in the management of anxiety and depression • Involve the community team	• Involve patients (or their surrogates if applicable) in decisions about end-of-life care • Demonstrate respect of cultural and religious beliefs and an awareness of their impact on decision making about end-of-life care planning • Respect dignity, confidentiality, legal constraints and preferences on the decisions of patients about end-of-life care	• Discussion on end-of-life care with a middle-aged patient with stage IV lung cancer	• Case Based Discussion • Simulation	2	• Participate in end-of-life discussion in 10 patients
15 Communicating with the patient	• Restate principles of communicating lung cancer diagnosis, treatment options and prognosis • Discuss timing, appropriate content of information and support of patient and family • Describe psychological needs and support of patient and family	• Break bad news in an empathetic and inclusive manner • Seek patient views and provide appropriate balanced information about diagnosis, treatment options and prognosis in order to facilitate decision making by patient. • Provide information to allow patient to make informed decision on value of treatment or procedure	• Involve patients and their family in decisions about treatment strategies • Offer balanced information and explain advantages and disadvantages of different treatment options to patient and/or family allowing him to take an informed decision • Seek the help and support of other professionals when appropriate (e.g family doctor, nurse) • Communicate in a clear manner with diagnosis, treatment options and prognosis using an understandable language • Consider and accept of the patient's views in decision making about management strategies	• Discuss diagnosis, prognosis and treatment options with a patient with stage IV lung cancer	• Case Based Discussion	2	• Explaining diagnosis, prognosis, treatment options and life expectations to a minimum of 30 lung cancer patients

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
16 Patient education	• Recall terms and basic principles of lung cancer, diagnostic procedures, treatment options and disease outcomes, focused on patient education	• Educate patients on self-management and discerning when to contact the oncology team	• Explain advantages and disadvantages of different treatment options to patient and/or family	• Discuss diagnosis, prognosis and treatment options with a patient with stage IV lung cancer			• Explaining diagnosis, prognosis, treatment options and life expectations to a minimum of 20 lung cancer patients
17 Smoking cessation	• Discuss effects of smoking on the health of the individual in relation to lung and other diseases • Describe the burden of smoking on health from a global perspective (health and economy) • List beneficial effects of smoking cessation in preventing lung and other disease • Explain treatment modalities for smoking cessation • List teaching methods available for smoking cessation • Recall health and safety measures in workplaces	• Manage smoking cessation therapy (pharmacological as well as non-pharmacological) in groups and in individuals	• Demonstrate awareness of opportunities for smoking cessation • Act in a manner that is respectful of the patients' rights, privacy, condition and capabilities	• Manage a lung cancer patient on smoking cessation therapy			• Discuss with smoking patients smoking cessation at every consultation
Module 19: Methodologies for clinical practice and research							
Modular Competency:	The learner is able to integrate best available evidence into practice in thoracic oncology.						
1 Study design and phases	• Differentiate various types of study • Categorise the different phases of trials for development of new treatments • Describe the different types of bias	• Set up an observational study • Draft methodology of an experimental trial including research question, inclusion and exclusion criteria, research methods and publication planning • Devise ways to avoid bias • Set up and coordinate a working group	• Generate ideas for clinical and experimental studies • Facilitate discussion about past or ongoing trials (e.g. journal club)	• Critical appraisal of a recent publication which shows a tremendous advantage of a new therapy	• Case-based discussion • Portfolio	4	• Attend a seminar for medical writing & methodology • Participate in critical review of papers (e.g. journal club for instance) and take the lead of presentation in at least 6 cases
2 Principles of biobanking	• Recall EU (and country-specific) regulations about biobanking • Review usage of biobanked tissues	• Take samples for biobanking routinely • Get an informed consent for biobanking from the patient	• Explain the why and how of biobanking to patients and family	• Shadowing another peer explaining about biobanking to a patient with a central tumour undergoing diagnostic fiberoptic bronchoscopy and obtaining his informed consent	• Audit • Multisource feed-back • Direct observation of skills	4	• Visit a biobank at least once • Obtain informed consent from at least 10 patients
3 Statistical analysis	• Describe basic descriptive and analytic statistics • Discuss survival analysis • Recall indications of advanced statistics such as multivariate analysis, Bayesian inference, meta-analysis, propensity scoring	• Perform simple statistic tests with appropriate software (median/mean, chi-2, Student-T, correlation) • Calculate a Kaplan-Meier survival estimate • Interpret data from a multivariate analysis • Decide when to involve a professional bio-statistician	• Demonstrate willingness to learn basic statistics to interpret and write papers. • Demonstrate willingness to ask help of a professional statistician • Demonstrate ability to distinguish statistical significance and clinical relevance	• Attendance to a seminar on biostatistics and methodology	• Portfolio • Direct observation of skills • Simulation	4	• Participate in the performance of basic statistics in at least one study

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
4 Evidence-based decision	• Recall principles of evidence-based medicine • Recall principles of evidence search • Distinguish difference between significance and pertinence	• Rank a finding from a paper in terms of level/grade of evidence • Perform an appropriate and rigorous search of the literature (use of PICO questions)	• Present a case discussion in terms of EBM • Develop sensitivity to distinguish clinical pertinence from statistical significance	• Attendance to a seminar on medical writing and methodology • Attendance to a seminar on EBM	• Direct observation of skills • Oral examination • Portfolio	4	• Participate in EBM discussions for patients whose particular situation is not addressed by existing guidelines
5 Guidelines assessment and application	• Relate guidelines for treatment of thoracic malignancies • Recall methodology how guidelines are developed and defined	• Select appropriate guidelines • Recognise patient situations which are not regulated by guidelines	• Explain guidelines and choice of treatment to a patient and his/her relatives • Present a patient's file at a multidisciplinary tumour board and propose a treatment strategy based on guidelines	• Attendance to a seminar on EBM • Engagement in an informal discussion on the use of guidelines with peers • Critical reading/appraisal of guidelines and information from industry	• Oral examination • Case-based discussion • Simulation	4	• Participate in tumour boards (at least 5 meetings) and argument by referring to guidelines and EBM statements
Module 20: Ethics							
Global Theme/Objective:	The learner will be able to respond to an individual patient's health needs with consideration of patient's rights and other ethical issues.						
1 Ethical issues	• Recall the patient's rights • List ethical and legal issues concerning end of life in given country of practice • Explain ethical issues and legal context of clinical trials • Discuss ethical issues regarding innovative therapies • Recall the role of the Institutional Ethical Committee	• Defend patients' rights and assess conflict in family situations. • Defend rights of patients to medical and paramedical colleagues and other administrative personnel during MDT discussion • Assess the educational and cultural background of the patient in the context of end of life	• Communicate effectively on patient's rights in the context of the patient, his/her family, and the medical/paramedical team • Communicate effectively in the context of clinical trial with patients, relatives and medical/paramedical team • Respect ethical and legal issues arising from clinical trials. • Discuss critical issues with the institutional ethics committee • Communicate on ethical issues regarding end of life with patients' relatives on one side, and paramedical staff on the other side • Act in a manner that is respectful of the patients' rights, privacy, condition and capabilities • Obtain a valid consent from patients or act appropriately if consent is withheld or cannot be obtained • Recognise the effect of different values/views and acts appropriately with colleagues/patients/families	• Case based discussion on management of lung cancer in a mentally disabled patient • Case based discussion on management of a patient with end stage metastatic cancer • Case based discussion of a patient who is eligible for a trial • Order writing for end of life care and levels of do not resuscitate (DNR) decisions	• Case based discussion • Simulation • Multi-source feedback	4	• In-depth discussion of patients' rights on a routine basis at staff meetings • Discussion with patients/relatives/team should be undertaken several times by the trainee. This is considered as all-day practice. At least 100 discussions should occur • Discussion with Ethical Committee members of at least one ethical issue pertaining a patient or a trial • Lead or assist in the discussion regarding trial inclusion in at least 5 patients

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
2 Conflicts of interest (COI)	• Describe current regulations in terms of conflict of interest • Categorise different types of conflict of interest	• Organise a proper disclosure of COI	• Demonstrate willingness for an honest disclosure of COI	• Case-based discussion on a professional sponsored for a conference by a company • Case-based discussion on getting a grant from tobacco industry	• Portfolio • Simulation		• Discuss 1 disclosure of COI with peers at least once
Module 21: Cancer related immunology							
Modular Competency:	The learner is up to date with current developments of immune therapies in cancer and available therapeutic options and is able to plan therapy for the purpose of management of the lung cancer patient.						
1 Basic principles related to cancer immunology	• Describe general structure of innate and adaptive immune recognition and responses in humans • Present and explain main mechanisms involved positive and negative stimulation in generating immune response • List the main methods of intervention and existing approaches in modulation immune response to tumours • List tumour related antigens • Present the role of tumour microenvironment in modulating tumour growth	• Explain basic principles to the patient and related oncology team	• Communicate with the team and the patient in simple terms the mechanism of actions and therefore the theoretical potentials side effects	• Evaluation of review articles related to immunity in patients with cancer • Review of at least 2 trials concerning immunotherapy for lung cancer.	• MCQ	1	• Attendance of a CME activity on cancer-related immunology and immunotherapy
2. Methods of immunomodulation therapy in cancer	• List and describe the main methods for immune intervention in cancer: - Adoptive Cell Transfer - Cancer Vaccines - Methods of Targeting Immune Suppression and immune control • Checkpoints in cancer - Therapeutic Monoclonal Antibodies - Use of chemokines for modulating tumor response and lymphocyte trafficking into the tumor • Use of tumor antigens for selective Targeting of Cancer cells • Describe ongoing trials in immunomodulation therapies	• Recognise patients who would benefit immune interventions • Evaluate possible contraindication for specific immunotherapies • Recognose portential association of immunotherapies with other treatment options.	• Communicate to patients and family concerning benefits and side effects of immunomodulation therapy in a clear and understandable manner				
3. Role of immune suppression in cancer	• Describe role of immune suppression in modulating risk of intrathoracic cancers • Describe the impact of immune suppression on the treatment strategy for patient with lung	• Assess and manage immunocompromised patients with thoracic malignancies	• Communicate to patient and family the impact of immunosuppression in a clear and understandable manner	• Case-based discussion of the Management of immunocompromised patients with thoracic malignancies	• Case based discussion	2	

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
	cancer						
4 Implementing immunotherapy in clinical settings	• Discuss eligibility and predictive factors for effective anti-tumor immune interventions • Describe currently available therapeutic options for immune intervention • Describe specific predictive factors for response • Describe modalities for evaluation of response in patient receiving immune-intervention to treat Cancer • List specific potential side effects related to immune interventions in patients with cancer • List possibilities of associations of immune with other treatments and be aware of possible synergies or antagonisms	• Evaluate eligibility of specific patients for immunotherapy • List and active search of contraindications for immunotherapy. • Monitor patients for reactions to the immunotherapy	• Assist the patient to understand the immunotherapy and changes in lifestyle as a consequence of the treatment	• Case based discussion of immunomodulator therapeutic intervention in Intrathoracic cancers	• Case based discussion • E-portfolio	2	

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
Module 22: Quality and economic considerations in lung cancer treatment							
Modular Competency:	The learner will understand the management, quality and economic principles underlying a thoracic oncology service. The learner will contribute to the improvement of health care delivery in a multi-disciplinary team and will be able to identify performance in different areas and propose improvement projects where applicable.						
1 Principles of quality management and its cost-effectiveness in thoracic malignancies	• List available guidelines concerning cancer treatment • Discuss the utility and cost-effectiveness of implementing a quality management program for the diagnosis and treatment of cancer • List items proposed by major scientific societies as elements useful in evaluating quality of care in patients with intra-thoracic malignancies • List and describe standardised measures that help to improve quality of care - Use of standardized protocols for diagnostic evaluation, treatment and follow up of patient with cancer - Standardizing reporting of diagnostic and follow-p procedures - Describe Utility of multidisciplinary teams for choosing diagnostic strategies and treatment options	• Negotiate with health care authorities regarding structural and management issues • Contribute to a quality report and identify potential points for improvement • Recognise local population needs and adapt clinical services accordingly	• Seeks solutions to structural and management issues to support better care for patients with thoracic malignancies • Describe the availability and access to support services for patients and families • Inform policy makers on population needs and suggest changes	• Participation in quality improvement projects • Reading publicly available quality reports of lung cancer centres	• MCQ • Min-CEX	4	• Write and present a health care quality improvement project for the local/network intrathoracic malignancy service
2 Methods for measuring/quantifying health impact of therapeutic intervention in patients with thoracic malignancies	• List and Present definitions of main indices used to evaluate the effect of therapeutic interventions and palliative care in thoracic malignancies (QALY, incremental cost-effectiveness ratio, cost-benefit analysis, DALY. quantitative health outcomes assessment, qualitative health outcomes assessment, hospital readmissions, time out of hospital) • Discuss limitations of applying such indices in evaluating health interventions in clinical settings	• Assess the impact of personalised therapeutic and palliative interventions (by using the indices stated in 'Knowledge' column) on local population • Negotiate with health care authorities and stakeholders about the funding of cost effective interventions	• Identify and raise issues in patients' therapeutic pathway that affect the indices and suggest measures of improvement customised to patients' needs and organisational infrastructure	• Participate in the collection and presentation of local data that assess the health impact of therapeutic and palliative interventions • Participate in the implementation of new measures aiming to improve the therapeutic pathway and its impact on patients' health.	• CBD • CWS • Portfolio	4	• Audit the health impact of current therapeutic and palliative interventions locally/in your network and /or audit the health impact of new improvement measures in the therapeutic pathway
3 Principles of cost-effectiveness of cancer diagnosis and treatment	• List and describe costs related to main diagnostic and therapeutic interventions in intra-thoracic malignancies • List and describe costs related to different individual components of	• Assess cost-effectiveness of diagnostic and therapeutic interventions provided locally to patients with intrathoracic malignancies • Assess cost effectiveness of	• Seek solutions to offer a financially sustainable service without compromising the quality and efficiency of services • Inform policy makers and	• Participation in cost improvement project in the local/network service	• Oral examination • Long case • E-Portfolio • MSF	3	• (Co-)Write (with the help of seniors or management support) and present a cost improvement project for the diagnostic / therapeutic / surveillance

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
	care and provision of services (direct and indirect as well as intangible costs) to patients with intra-thoracic malignancies • Describe cost related to side effects of therapeutic interventions and recurrent hospital admissions • Describe economic impact of preventive strategies for intra-thoracic malignancies • List methods used for economic health technology assessment • Discuss the perspectives of different stakeholders (patients, doctors and commissioners) concerning costs related to cancer diagnosis and treatment • Present and explain the utility of Biomarker use for limiting costs related to innovative therapies for intra-thoracic malignancies.	local preventive strategies for intrathoracic malignancies • Identify income generated by the diagnostic and therapeutic interventions and the overall provision of care to patients with intrathoracic malignancies	stakeholders on proposals of cost improvement (i.e reducing unnecessary costs and reallocating costs in the patients' pathway to ensure best possible clinical effectiveness of the services provided)				/ preventive strategies that are used in your local/network service of intrathoracic malignancies
4 Cancer registries	• Describe usefulness of cancer registries for auditing intrathoracic malignancies, level and quality of provided care. • Describe usefuleness of cancer registries in benchmarking local/network services against other National/European providers and national average	• Contribute to the collection of data by the cancer registry • Clinical validation of submitted data • Assess data provided by cancer registry • Identify areas of good and poor performance • Route cause analysis of poor performance	• Seek solutions to areas of poor performance • Inform stakeholders about performance and request feedback	• Participate in the management/maintenance of local/network cancer registry for intrathoracic malignancies	• E-Portfolio	4	• Set up a local cancer registry for intrathoracic malignancies in the case it does not already exist • Or if there is an existing registry, present the collected data of the last 6-12months in comparison to previous years and other providers (if available).
5 Multi-disciplinary team meetings	• Describe composition (different specialities) of a thoracic oncology MDT meeting • Identify roles and responsibilities of each MDT member • Describe ideal timing of MDT meeting • Describe existing policies and procedures regarding MDT meetings locally • Identify locally existing internal and external communication channels between specialties that are in the multi-disciplinary team • Identify locally existing health care services and social services • Describe purpose of MDT meeting	• Triage and identify all patients that must be presented to MDT meetings • Ensure availability of all relevant clinical and social information during MDT discussion so that an informed decision can be reached • Coordinate with local health care services and social services • Coordinate patient care using multiple members of the care team • Interact with the other members of the MDT and exchange information on potential treatment options, organisational policies or other topics of interest to the	• Lead the MDT by facilitating decision making and exchange of information between various specialties • Manage disease including biopsychosocial or spiritual aspects • Communicate to patient and family the role and importance of MDT meeting • Teach the patient and family about their care and how to self-manage disease processes • Discuss with the patient the achievement of goals and objectives that are adapted to the changing biopsychosocial nature of their disease	• Participate in at least 40 MDT meetings • Participating in a leadership role in a MDT meeting • Case-based discussion of a patient presented and managed by an MDT	• E-portfolio • CBD • MCQ	4	• Write a full case report on a lung cancer patient managed and followed up by an MDT that you have chaired. The report should also summarise all MDT discussions, including challenging ones, and how a consensus was reached.

Syllabus Items	Knowledge	Skills	Attitudes	Teaching and Learning Opportunities	Assessment Tools	Level of Assessment	Minimum Clinical /Educational Exposure
		MDT • Teach other team members about patient health issues and provide additional disciplinary specific insight into the patient case being discussed • Negotiate with other MDT members and other external health care providers (e.g. home care services)					