

Continuing Professional Development - Thoracic oncology

Module 1. Carcinogenesis, immunology and defence mechanisms

1. Carcinogenesis
 - 1.1. Basic principles of carcinogenesis, including the dysplastic lesion-carcinoma *in situ*-invasive lesion sequence
 - 1.2. Tumour immunology
 - 1.2.1 Epithelial and immune cells crosstalk
 - 1.2.2 Basic principles related to tumour immunology, including the general structure of innate and adaptive immune recognition and immune responses in humans as well as the elimination-equilibrium-escape sequence
2. Hallmarks of cancer
 - 2.1. Self-sufficiency in growth signals
 - 2.2. Insensitivity to anti-growth signals
 - 2.3. Evasion from programmed cell death (apoptosis)
 - 2.4. Limitless replicative potential
 - 2.5. Sustained angiogenesis
 - 2.6. Tissue invasion and metastasis
 - 2.7. Deregulated metabolism
 - 2.8. Evasion from the immune system
 - 2.9. Genome instability
 - 2.10. Inflammation

Module 2. Tobacco - risk factors and epidemiology

1. Current epidemiology of active, passive and thirdhand smoking, heated tobacco products and smokeless tobacco products as well as other smoked or vape-related products worldwide and nationally in relation to thoracic malignancies
2. Pathogenic mechanisms of active, passive and thirdhand smoking, heated tobacco products and smokeless tobacco products as well as other smoked or vape-related products related to thoracic malignancies
3. Socio-economic and cultural aspects of tobacco consumption related to thoracic malignancies

Module 3. Indoor and outdoor pollution

1. Basic principles of indoor and outdoor pollution related to thoracic malignancies

Module 4. Respiratory hazards associated with occupational factors

1. Occupational carcinogens that cause thoracic malignancies; causal relationships

Module 5. Asbestos-related diseases

1. Asbestos-related diseases
2. Non-malignant pleural manifestations (acute benign pleural effusions, rounded atelectasis, diffuse pleural thickening and pleural plaques)
3. Malignant pleural mesothelioma
4. Asbestosis
5. Lung cancer related to asbestos

Module 6. Lung cancer screening (LCS)

1. Benefits and risks of LCS
2. Risk stratification models
3. Low dose computed tomography (CT) as an evidence-based measure for lung cancer screening in high risk populations
4. Technical aspects in LCS
5. Limitations and bottlenecks in LCS
6. The role of smoking cessation in LCS
7. Nodule management protocols in LCS
8. Management of incidental findings in LCS

Module 7. Signs and symptoms

1. Symptoms as potential indicators of thoracic oncological disease:
 - 1.1. Dyspnoea
 - 1.2. Dysphagia
 - 1.3. Chest pain
 - 1.4. Bone pain
 - 1.5. Headache
 - 1.6. Tiredness
 - 1.7. Cough
 - 1.8. Haemoptysis
 - 1.9. Wheezing
 - 1.10. Stridor
 - 1.11. Hoarseness
 - 1.12. Weight loss
 - 1.13. Diaphragmatic elevation
 - 1.14. Pleural effusion
 - 1.15. Pericardial effusion
 - 1.16. Superior vena cava syndrome
 - 1.17. Pancoast syndrome
 - 1.18. Horner syndrome
 - 1.19. Enlarged, non-moveable and/or indurated cervical, supraclavicular or nuchal lymph nodes
 - 1.20. Neurological signs or symptoms
 - 1.21. Paraneoplastic skin disorders (erythema gyratum repens, acanthosis nigricans etc)
2. Awareness of paraneoplastic syndromes including:
 - 2.1. Cachexia
 - 2.2. Hypercalcemia
 - 2.3. Thromboses and pulmonary embolism
 - 2.4. Syndrome of inappropriate antidiuretic hormone (hyponatremia)
 - 2.5. Ectopic adrenocorticotrophic hormone syndrome
 - 2.6. Lambert-Eaton syndrome
 - 2.7. Clubbing and periostitis

Module 8. Imaging techniques

1. Chest X-ray
2. Thoracic ultrasound
3. Computed tomography (CT) scan
4. Positron emission tomography (PET)
5. PET-CT
6. Ventilation perfusion scan
7. Bone scan
8. Octreotide scan
9. Single-photon emission computed tomography (SPECT)
10. Magnetic resonance imaging (MRI)
11. PET MRI
12. Basic principles of each imaging modality as well as basic radioprotection measures

Module 9. Bronchoscopy

1. Indications, contraindications, limitations and benefit-risk assessment as well as quality aspects for diagnostic flexible and rigid bronchoscopy and diagnostic techniques in the context of thoracic oncology
2. Principles of discontinuation and bridging of anticoagulants
3. Principles of sedation
4. Sampling and handling of probes

5. Haemorrhage management protocols in bronchoscopy

Module 10. Advanced endoscopy

1. Indications, contraindications, limitations and benefit-risk assessment as well as quality aspects for each advanced procedure (EBUS radial and linear/EUS, navigation bronchoscopy (incl. electromagnetic navigation approach), stents, cryotherapy, laser techniques, argon plasma, brachytherapy, electrocautery, photodynamic therapy, endobronchial balloon dilatation, endobronchial microwave ablation, cone beam CT application) in the context of thoracic oncology
2. Different ranges of the methods
3. Basic lymph node anatomy/stations of the mediastinum
4. Principles of discontinuation and bridging of anticoagulants
5. Principles of sedation
6. Sampling and handling of probes
7. Sample optimisation and handling

Module 11. Thoracoscopy

1. Indications, contraindications, limitations and benefit-risk assessment as well as quality aspects for diagnostic thoracoscopy in the context of thoracic oncology
2. Indications, contraindications, limitations and benefit-risk assessment as well as quality aspects for therapeutic thoracoscopy in the context of thoracic oncology (talc pleurodesis)
3. Principles of discontinuation and bridging of anticoagulants
4. Principles of sedation
5. Sampling and handling of probes

Module 12. Other sampling techniques

1. CT guided biopsy (lung and pleura)
2. Ultrasound guided biopsy (lung and pleura)
3. Pleural tap
4. Cytology Positivity Rates and false negatives
5. Chest tube insertion and management

Module 13. Pathology

1. Basic principles of proper handling of samples in suspected thoracic malignancies
2. Basic principles of diagnostic steps in pathology related to thoracic malignancies
 - 2.1 light microscopy: Small cell carcinoma (SCC) vs non-small cell carcinoma (NSCLC), squamous vs non-squamous carcinoma, carcinoids
 - 2.2 role of immunohistochemistry
3. Multigene versus single gene molecular detection techniques for actionable mutations (EGFR, BRAF, MET, KRAS, Her 2) and gene rearrangements (ALK, ROS1, RET, NTRK1), resistance mechanisms (mutations, amplifications, overexpression)
4. Tissue preservation and quality of samples (adequate tumour contents) for light microscopy, immunohistochemistry and molecular pathology (DNA and RNA studies)
5. Quality and suitability of cytology and histology specimens for NGS
6. Liquid biopsy (cell free DNA, circulating tumour DNA): definition, indications

Module 14. Evaluation of patient fitness for diagnostics and therapy

1. Basic principles of evaluation of patient fitness for diagnostics and therapy

Module 15. Multidisciplinary team and multidisciplinary team meeting

1. Importance of multidisciplinary teamwork throughout the continuum of thoracic malignancies
2. Multidisciplinary team meeting as the hallmark of decision-making in the process of care for patients with thoracic malignancies
3. Quality requirements and monitoring for diagnosis, treatment and follow-up

Module 16. Thoracic surgery

1. Basic principles and indications of thoracic surgery in thoracic oncology
2. Types of surgical approaches in thoracic surgery (open thoracotomy, minimal invasive i.e. VATS, RATS)

3. Types of resections in thoracic surgery
4. Role of thoracic surgery in diagnosis as well as curative and palliative treatment
5. Role of thoracic surgery in oligometastatic disease

Module 17. Radiotherapy

1. Basic principles and indications of radiotherapy in thoracic oncology
 - 1.1 Types of radiotherapy techniques: Tomotherapy, VMAT, IMRT, stereotactic body radiotherapy (SBRT), proton beam therapy
 - 1.2 Quality monitoring and guidelines for safety
 - 1.3 Irradiation of extra thoracic disease with its specific complications/side effects
2. Role of radiotherapy in curative, oligometastatic and palliative treatment

Module 18. Systemic therapy in lung cancer

1. Basic principles of systemic therapy in lung cancer
2. Indications, contraindications and combinations of anti-neoplastic regimens
 - 2.1. Non-small cell lung carcinoma (NSCLC)
 - 2.2. Large cell neuroendocrine tumor
 - 2.3. Small cell lung cancer (SCLC)
 - 2.4. Carcinoid tumors (typical and atypical)
 - 2.5. Other rare lung tumors (eg adenoid cystic lung tumor)
 - 2.6. Mesothelioma
 - 2.7. Thymoma
 - 2.8. Thymic carcinoma
 - 2.9. Other mediastinal tumours
3. Oncogenic driver mutations in lung cancer
4. Indications and contraindications of target therapies
 - 4.1. Non-small cell lung carcinoma (NSCLC)
 - 4.2. Thymic Carcinoma
 - 4.3. Resistance: mechanisms, diagnosis and treatment
5. Antibody drug conjugate

Module 19. Immunotherapy

1. Basic principles and methods of cancer immunotherapy
2. Indications and contraindications for immunotherapy including combination therapy with chemotherapies
3. NSCLC
4. SCLC
5. Mesothelioma
6. Describe the basic principles of immunotherapy planning

Module 20. Rehabilitation

1. Basic principles and indications of rehabilitation programmes
2. Value of rehabilitation programmes in the pre-operative setting as well as after completion of tumour-specific therapy

Module 21. Smoking prevention and cessation

1. Effects of smoking, heated tobacco products and smokeless tobacco products as well as other smoked or vape-related products on the health of the individual in relation to thoracic oncology
2. Beneficial effects of smoking cessation for preventing thoracic malignancies as well as during and after treatment of thoracic malignancies
3. Treatment modalities for smoking cessation

Module 22. Palliative care including treatment of tumour-related symptoms and complications

1. Basic principles of palliative care in thoracic oncology including its early integration as well as end-of-life care
2. Basic principles and options regarding treatment of the following tumour-related symptoms and complications:

- 2.1. Dyspnoea
- 2.2. Pain
- 2.3. Tracheobronchial stenosis
- 2.4. Haemoptysis
- 2.5. Cough
- 2.6. Sialorrhea
- 2.7. Nausea/vomiting
- 2.8. Seizures
- 2.9. Pathologic fractures
- 2.10. Vertebroplasty
- 2.11. Vena cava syndrome
3. Treatment of pleural disease
 - 3.1. Talc pleurodesis
 - 3.2. Indwelling Pleural Catheter

Module 23. Patient and family support

1. Teach the patient to recognise early symptoms of lung cancer and early symptoms of disease recurrence and to contact his/her physician
2. Teach the patient to recognise early side effects and to contact his/her physician
3. Importance of a multidisciplinary team for both provision of care and surveillance

Module 24. Management of paraneoplastic syndromes

1. Basic principles of management of the following paraneoplastic syndromes:
 - 1.1. Cachexia
 - 1.2. Hypercalcemia
 - 1.3. Paraneoplastic stroke
 - 1.4. Marantic endocarditis
 - 1.5. Syndrome of inappropriate antidiuretic hormone (hyponatremia)
 - 1.6. Ectopic adrenocorticotrophic hormone syndrome
 - 1.7. Lambert-Eaton syndrome and other neurological disorders (e.g. anti-HU associated symptoms)
 - 1.8. Clubbing and periostitis
2. Awareness that the presence of paraneoplastic syndromes *per se* does not exclude curative treatment in thoracic oncology

Module 25. Thromboembolic disease in thoracic oncology

1. Prevention of thromboembolism in thoracic oncology
2. Diagnostic and therapeutic management of venous thrombosis and pulmonary embolism in thoracic oncology

Module 26. Thoracic oncology emergencies: signs, symptoms, diagnosis and management

1. Spinal cord compression
2. Symptomatic Brain metastasis (vasogenic edema, seizures, midline shift)
3. Massive haemoptysis
4. Central airway obstruction
5. Superior vena cava syndrome
6. Pneumothorax and haemothorax
7. Pneumomediastinum
8. Massive pleural effusion
9. Cardiac tamponade
10. Tracheo-oesophageal fistula

Module 27. Thoracentesis including a chest tube and a tunnelled indwelling pleural catheter

1. Indications, contraindications, limitations and benefit-risk assessment as well as quality aspects for thoracentesis including a chest tube and a tunnelled indwelling pleural catheter
2. IPC pleurodesis

3. Principles of discontinuation and bridging of anticoagulants

4. Principles of sedation

Module 28. Common side effects of systemic therapies and their management

1. Side effects of chemotherapy and their management

1.1. Haematological side effects: neutropenia, febrile neutropenia, anaemia and thrombopenia

1.2. Mucositis/oesophagitis

1.3. Alopecia and dermatological toxicity

1.4. Nausea, vomiting and diarrhoea

1.5. Neurotoxicity

1.6. Ototoxicity

1.7. Hepatic toxicity

1.8. Nephrotoxicity

1.9. Cardiovascular toxicity

1.10. Extravasation: infertility and teratogenesis

1.11. Electrolyte imbalance

1.12. Side effect in patients with thoracic oncological disease treated with systemic therapy

2. Side effects of targeted therapy and their management

2.1. Dermatological toxicity

2.2. Diarrhoea

2.3. Hepatic toxicity

2.4. Cardiovascular toxicity

2.5. Pulmonary toxicity

2.6. Nephrotoxicity

3. Side effects of immunotherapy and their management

3.1. Pneumonitis

3.2. Dermatological toxicities

3.3. Hepatic toxicity

3.4. Cardiovascular toxicity (*e.g.* myocarditis)

3.5. Endocrinological toxicities

3.6. Nephrotoxicity

3.7. Neurological toxicities

3.8. Side effect in patients with thoracic oncological disease treated with immunotherapy

3.9. Hematologic toxicity

4. Side effects of ADC and their management (antibody drug conjugate)

5. Oncologic therapies in the context of viral pandemics

Module 29. Common radiation-induced side effects and their management

1. Radiation-induced pneumonitis (short-term) and fibrosis (long-term)

2. Radiation-induced oesophagitis

3. Cardiac toxicity

4. Tracheal complications

5. Skin reactions

6. Secondary malignancy

7. Radiation-induced side effect in patients with thoracic malignancies treated with radiotherapy

8. Risk of radiotherapy-induced malignancies

Module 30. Solitary pulmonary nodules

1. Basic principles of solitary pulmonary nodule management including radiological characteristics as well as core diagnostic and follow-up strategies

2. Up-to-date guidelines for the management of solitary pulmonary nodules

Module 31 Malignant pleural mesothelioma

1. Basic principles of diagnostic (recommended procedures and histopathology) and therapeutic management of malignant pleural mesothelioma including multi-modal treatment modalities

Module 32. Mediastinal tumours

1. Basic principles of diagnostic and therapeutic management of common mediastinal tumours (thymoma and lymphoma)

Module 33. Common metastatic pulmonary tumours

1. Metastatic pulmonary tumours as a differential diagnosis of pulmonary nodules/masses (*e.g.* pulmonary metastasis in thyroid, colorectal, prostate, renal or mammary gland carcinoma as well as soft tissue sarcoma and osteogenic sarcoma)

Module 34. Malignant pleural effusion

1. Basic principles of diagnostic and therapeutic management of malignant pleural effusion