UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES
EUROPEAN UNION OF MEDICAL SPECIALISTS
Association International Sans But Lucrative
International non-profit Organization

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UEMS Section & Board of Pathology

European Training Requirements for the Specialty of Pathology European Standards of Postgraduate Medical Specialist Training (previous chapter 6)

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Nothing is possible without men
Nothing is lasting without institutions
Jean Monnet

Preamble

The UEMS is a non-governmental organization representing national associations of medical specialists at the European Level. With a current membership of 34 national associations and operating through 39 Specialist Sections and European Boards, the UEMS is committed to promote the free movement of medical specialists across Europe while ensuring the highest level of training which will pave the way to the improvement of quality of care for the benefit of all European citizens.

The UEMS areas of expertise encompass Continuing Medical Education, Post Graduate Training, and Quality Assurance.

UEMS believes that the quality of medical care and expertise is directly linked to the quality of training provided to the medical professionals. Therefore, the UEMS is committed to contribute to the improvement of medical training at the European level through the development of European Standards in the different medical disciplines. No matter where doctors are trained, they should have at least the same core competencies when granted with UEMS certificate/diploma of pathology board exam recognition.

Following the legal mechanism for ensuring the free movement of doctors within Europe through the recognition of their qualifications established in the 1970s by the European Union, in 2005, the European Commission suggested to the European Parliament and Council that there should be a single legal framework for the recognition of professional qualifications to facilitate and improve the movement of all workers throughout Europe. This directive (Directive 2005/36/EC) defined the mechanism for automatic mutual recognition of qualifications for doctors according to the training requirements within the individual member states; this is based on the length of training in the specialty and the type of qualification.

In 1994, the UEMS adopted its Charter on postgraduate medical training aimed at providing the recommendations to be applied within Europe. The six chapters of this charter set out the basis for a European approach to postgraduate medical training. Chapters 1-5 would be common to all specialties. “Chapter 6” would be completed by each Specialist Section according to the specific needs of each discipline.

More than a decade after the introduction of this Charter, the UEMS Specialist Sections and European Boards have continued working on developing these European Standards in Medical training, reflecting modern medical practice and current scientific findings. In doing so, the UEMS Specialist Sections and European Boards **aim not to supersede the National Authorities' competence in defining the content of postgraduate training in their own State, but rather to complement them and ensure that standardized high-quality training is provided across Europe.**

Moreover, aims of Pathology ETRs are the establishment and continuous improvement of a Pan European Assessment Process, which will include a common Syllabus and the construction of a common Curriculum, Training Programme and an Exit Examination with its Eligibility Criteria, incorporating minimum Postgraduate training experience, specified Logbook, Blueprint and process. The other main objective is to complement and support EU or national legislation by offering robust European training guidelines created by medical specialists and based on EU wide experience for the benefit of EU patients.

Given the long-standing experience of UEMS Specialist Sections and European Boards on the one hand and the European legal framework enabling Medical Specialists and Trainees

to move from one country to another on the other hand, the UEMS is uniquely in position to provide specialty-based recommendations for appropriate training requirements.

The UEMS values professional competence as “the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served”.

While professional activity is regulated by national law in EU Member States, it is the UEMS understanding that it has to comply with International treaties and UN declarations on Human Rights as well as the WMA International Code of Medical Ethics.

This document derives from the previous Chapter 6 of the Training Charter and provides definitions of specialist competencies, procedures and relate documentation. For the sake of transparency and coherence, it has been renamed as “Training Requirements for the Specialty of Pathology”.

Background

This document aims to provide the basic Training Requirements for the specialty of Pathology and has been updated by the UEMS Section and Board for Pathology to reflect scientific, recent medical progress and changes in the European Curriculum for Pathology. The three-part structure of this document reflects the UEMS approach for a coherent pragmatic document not only for medical specialists, but also for decision-makers at the National and European level, interested in knowing more about medical specialist training.

The objectives of the UEMS Section and Board for Pathology include

- Supporting the delivery of the **highest level of training** for current and future medical **Pathology Specialists**;
- Establishment and continuous improvement of Pan-European Assessment Process which will include a common Syllabus and Curriculum for pathology Training, Exit Examination and Eligibility Criteria
- Enabling and promoting **the free movement of PS** within the EU and beyond in Europe;
- **Representing the profession** within the member states of the EU and its associated countries, to EU authorities and any other authority dealing with questions directly or indirectly concerning Pathology
- **Support** the continuous development of Pathology in countries
- **Promoting the professional interests of European Pathologists** including support for the development of an appropriate workforce.

The European Core Curriculum in Pathology document represents the detailed description of the competence and skills of the PS and is a document jointly endorsed by the UEMS Section and Board for Pathology and the European Society for Pathology (ESP). The curriculum is approved by representatives of all individual national Pathology societies and professional organizations represented in the UEMS. The curriculum forms part of this document as “Section I”.

The UEMS Section and Board recognizes the need for a unifying document for Pathology based on minimum training requirements and recognition of professional competences and qualifications. This document (the ETR) therefore states the agreed minimum standards to all countries in Europe for training requirements. National authorities may choose to supplement the recommendations in the ETR with either additional competences or with explicit standards and assessment tools relevant to that country, but in respect to the minimum ETR standards.

There are structures within the UEMS for accreditation and quality assurance of aspects of specialist training, and the Section and Board for Pathology recommends that individual countries undertake such accreditation as appropriate and to complement their national authority rules.

This current ETR document has a basis in the previously mentioned Chapter 6 of the Charter on Postgraduate Medical Specialty Training and provides high level definitions of specialist competencies and procedures required and guidance on assessment and documentation of competence.

PATHOLOGY

Pathology is the branch of medicine involved in the study of diseases. It represents a strong bridge between basic/translational research and clinical medicine; it encompasses every aspect of patient care, from morphologic diagnostic approach as well as additional testing protocols and treatment advice, to cutting-edge genetic technologies.
The purpose of Pathology is to diagnose diseases with respect to their classification, aetiology, pathogenesis and their clinicopathological behaviour, and the evaluation of diagnostic and prognostic methods as well as the effects of therapeutic interventions by morphological and functional examination of cells and tissue samples, from gross examination to the molecular lab, including conventional and advanced microscopy and supporting techniques of molecular pathology to demonstrate expression of genes and gene products. The pathologist offers advice and support to fellow clinicians for the benefit of individual patients, the improvement of the quality of diagnostic methods and a better clinicopathological understanding of disease.

Pathology is a specialty in which time, pre-analytical and technical procedures are critical, in the everyday routine practice and when during open surgery the modality choice and the rapid on-site evaluation of a frozen section require skills and highest scientific preparation of the dedicated Specialist.
Pathology encompasses knowledge and skills of surgical pathology, autopsy pathology and cytopathology and additional competences in areas of special interest such as dermatopathology, forensic pathology, neuropathology, paediatric pathology, cardiovascular pathology and paleopathology.
Finally, patient education and public health aspects must be also be considered.
Nowadays, is clear how PS plays a fundamental role in modern healthcare systems, addressing the comprehensive diagnostic needs of all patients, coordinating and directing the therapy choices. PS must possess not only the essential scientific knowledge and skills necessary for complete and correct diagnosis, but also the organizational insights and capabilities needed to work efficiently in the pathology laboratory/department, cytopathology office, the autoptic and forensic department, additionally joined with molecular biology facility and other modern technologies (eg. bioinformatics, biobanking).

Devising a Core and Training Curriculum is rather a difficult task in relation to the variable role and structure of Pathology across Europe, to the new technologies implemented and the intense relationship with clinical, scientific and technical development.
In addition, the status of Pathology varies between being a primary specialty and the several so-called “sub-specialties”, such as Cytopathology, Dermatopathology, Pediatric Pathology, Neuropathology, Forensic, Cardio-pathology, Nephro-pathology, Paleopathology which are not recognized “per se”, but are “integral parts” of Pathology, and for the safety and care of patients necessitate of special additional training program. This emphasizes the need for common standards for European Training Requirements definition, ensuring high quality care for patients whilst promoting free movement of physicians and the development of the specialty, as well as PS dignity, central position in therapy choice, and last, but not least pertinent economic reward.

TRAINING REQUIREMENTS FOR TRAINEES
Content of training and learning outcomes – Pathology Core Curriculum

Introduction

The trainee is a medical doctor. The trainee works in an accredited training program to become a **Pathology Specialist**, and in different countries is referred as **intern, resident, fellow or registrar**, herein referred as Trainee.
A trainee entering specialist training should meet the personal specification which determines the requirements for entry to the specialty training program in the nation. The trainee should maintain general medical registration, should maintain Good Medical Practice and should register as a trainee with the national professional body. The trainee should have adequate linguistic ability to communicate with fellow-physicians, laboratory staff and other personnel involved, and to study international literature and communicate with foreign colleagues. The trainee should keep their own personal training record up to date according to national rules and EC directives as well as considering UEMS Section/Board of Pathology recommendations.

Content of training and learning outcome

Theoretical knowledge

As seed, Pathology encompasses knowledge of surgical pathology and autopsy pathology. Neuropathology, dermatopathology and cytopathology are regarded as integral parts of pathology and basic knowledge is mandatory. Advanced levels of competences in neuropathology, cytopathology and others can be obtained by adequate training and assessment.

Basic:

- experience of the interpretation of diagnostic techniques required to achieve competence
- experience of the use of relevant equipment used in histopathology
- knowledge of the principles of other relevant areas such as biochemistry, epidemiology, genetics, informatics, digital pathology, and medical statistics

Specific:

- to gain deepened knowledge in pathology in general, which includes autopsy pathology, histopathology, cytopathology including fine-needle aspiration cytology, as well as molecular pathology, histochemistry, immunohistochemistry and ultrastructural pathology the acquisition of the ability to assess morphological changes in cells, tissue and organs and to appreciate their pathogenetic and clinical implications
- to gain general and systematic knowledge of disease processes, tumours and transplantation in areas such as cardiovascular pathology, dermatopathology, digestive pathology, endocrine pathology, gynaeco-pathology, immunology, neuropathology, paediatric pathology, in order to be able to provide specialist advice

Complementary:

- to gain adequate knowledge in areas such as ethics, forensic medicine, imaging diagnostics, medical genetics, Artificial Intelligence and toxicology

Elective:

- additional training such as laboratory techniques, screening of diseases, research methodology, tissue banking and data collection.

Competencies and obligatory professional activities:

- have the ability to recognize and work within personal limits of competence
- have knowledge of and participate in internal and external quality control in all appropriate aspects of pathology
- attend appropriate accredited meetings and courses as part of a programme of Continuing Professional Development (CPD)
- acquire life-long habits of reading and competence for critical evaluation of the literature
- have knowledge of the use of informatics in diagnostic pathology
- acquire skills for organizing and managing clinical-pathologic conferences and multi-disciplinary team meetings
- acquire a knowledge of the principles of management necessary in providing an effective service
- acquire an understanding of the use of laboratory equipment and procedures
- acquire the knowledge and skills necessary to set up and use a microscope and have an appreciation of different forms of microscopy
- acquire an understanding of the methods used to prepare histologic slides
- acquire an understanding of histochemical and immunohistochemical techniques
- acquire the ability to evaluate organs before and after transplantation
- acquire the ability to integrate clinical data with the pathological diagnosis and provide useful prognostic and therapeutic suggestions and advice
- undertake the macroscopic examination and sampling of surgical specimens so as to acquire the competencies necessary for independent specialist practice
- undertake the microscopical examination of histopathological samples, covering all or most topics of pathology, with increasing autonomy in the diagnosis, so as to acquire the appropriate competencies necessary for independent specialist practice
- undertake the microscopical examination of cytopathology samples, including gynaecological and non-gynaecological (fine-needle including guided sampling procedures) samples so as to acquire the appropriate competencies necessary for independent specialist practice
- acquire the ability to evaluate additional investigative methods, such as histochemical stains and immunohistochemical reactions, molecular methods, and new techniques (-omics), to support the pathological diagnosis
- acquire the ability to integrate molecular data with morphological findings to achieve a conclusive diagnosis
- examination of frozen sections to acquire the appropriate competencies necessary for independent specialist practice
- acquire necessary competencies in autopsy Pathology.

Organization of training

Schedule of training

The duration of the training in Pathology is five years on a full-time basis, or the equivalent if training is less than full-time. The UEMS Section/Board of Pathology recommends the harmonization of postgraduate training in Pathology, the recognition and the accreditation of training programs in the EU member states. Completion of training is foreseen after a minimum period of five years, on a full-time basis, or the equivalent if training is less than full time, the common trunk preferably being four years. If the requirements cannot be fulfilled in one department of Pathology or in the related network, a rotation to another recognized training center of Pathology must be warranted. Training should comprise a common trunk that will typically include a major component of general pathology training, together with a period of special training in an area of interest, or general further training in depth.

Curriculum of training

The trainee should satisfactorily complete training in core aspects of Pathology, which are outlined in their national curriculum, approved by the UEMS Board of Pathology

Basic knowledge and skills

Clinical histopathology including surgical pathology, autopsy, cytopathology and molecular pathology.

The following **Core Curriculum** specifically enlists the subjects that the Trainee will be able to recognize, correctly and completely diagnose, along with the pertinent procedures. This list is meant to guide European Trainees and specialists in acquiring the core competences in Pathology and in preparing for the European Assessment in Pathology.

After completing the module, the Trainee is expected to demonstrate knowledge of:

General Pathology

1. Physical basis of the operation of optical and electron microscopy
2. Basics of histological preparations
3. Theoretical basis of immunohistochemical methods
4. Biochemical basis of molecular diagnostic methods
5. Immunohistochemistry, electron microscopy and molecular methods
6. Elements of bioinformatics and computer assisted diagnosis
7. Pathogenesis, histological diagnosis and hemodynamic disorders
8. Morphological diagnosis of the causes of circulatory failure and shock
9. Pathogenesis and basics of morphologic patterns of inflammation
10. Mycobacterial Infection
11. General pathology of autoimmune diseases
12. Morphological diagnosis and differentiation of connective tissue diseases
13. Epidemiology of cancer
14. Molecular basis of carcinogenesis and progression of cancer
15. Basics of histogenetic classification of cancer
16. Prognostic and predictive factors of malignant tumors with emphasis on diagnosis
17. Pathologic elements of bioterrorism

Skin

18. Non-malignant skin diseases, premalignant and malignant skin tumors
19. Inflammatory skin diseases, bullous diseases, genodermatosis
20. Premalignant lesions and skin epithelial tumors
21. Non-epithelial skin tumors
22. Nevi and malignant melanoma

Head&Neck

23. Inflammatory diseases and non-neoplastic diseases of oral cavity
24. Precursors and invasive cancer of the oral cavity
25. Neoplasms of the oral cavity
26. Inflammatory lesions of nose and paranasal sinuses
27. Cancer of the pharynx, nose, paranasal cavities and tonsils
28. Non-neoplastic lesions of tonsils
29. Classification, diagnosis and differential diagnosis of dental cysts
30. Dental neoplasia
31. Other diseases of jaw, including intra-bone lesions

Upper and Lower Airways

32. Inflammatory lesions of larynx and trachea
33. Most common neoplasms of head and neck
34. Neoplasms of larynx and trachea, diagnosis and prognostic factors
35. Classification and differential diagnosis of pneumonia
36. Diagnosis of interstitial lung diseases
37. Other non-neoplastic lung diseases
38. Lung cancer: epidemiology, pathogenesis, classification, prognostic factors
39. Biopsy material from bronchoscopy and transthoracic biopsy
40. Differentiation between primary tumors of the lung and metastases
41. Another primary lung tumors
42. Inflammatory and non-neoplastic diseases of the pleura
43. Mesothelioma
44. Metastatic tumors of the pleura, effusions and differential diagnosis

45. Thymoma: classification and diagnosis
46. Primary and secondary neoplasms of the mediastinum
47. Other thymic lesions

Endocrine

48. Endemic goiter, thyroiditis and cytology
49. Thyroid tumors, including evaluation of cytological material
50. Parathyroid diseases: hypertrophy, adenomas, cancer
51. Adrenal adenoma and cortical Carcinoma
52. Neuroblastoma: epidemiology, diagnosis, prognostic factors
53. Pheochromocytoma
54. Pituitary adenomas and carcinomas
55. Main diseases of other endocrine glands

Digestive Tract

56. Congenital gastrointestinal disorders
57. Gastrointestinal diseases, with endoscopic material
58. Esophagitis
59. Reflux disease of the esophagus and its consequences
60. Esophageal cancer
61. Gastritis
62. Pre-cancerous lesions of the stomach
63. Gastric cancer: pathogenesis, epidemiology, classification, diagnosis
64. Appendicitis
65. Non-neoplastic diseases of the duodenum and small intestine
66. Malabsorption syndromes
67. IBD: ulcerative colitis, Crohn, ischemic colitis
68. Gastrointestinal polyps
69. Duodenal epithelial tumors
70. Colo-Rectal Carcinoma: pathogenesis, epidemiology, classification
71. Other colorectal neoplasms
72. Marginal zone lymphoma – malt and other gastrointestinal lymphomas
73. Gastrointestinal stromal tumors (GIST) and other mesenchymal tumors
74. Salivary glands inflammatory diseases
75. Salivary glands neoplasms
76. Acute and chronic hepatitis with focus on core needle biopsy
77. Cirrhosis with focus on core needle biopsy
78. Primary and secondary liver malignancies, and cytopathology
79. Other liver diseases
80. Cholelithiasis, cholecystitis, malignant gallbladder tumors
81. Acute and chronic pancreatitis
82. Pancreatic cancer with focus on cytopathology
83. Other pancreatic neoplasms
84. Other exocrine part of pancreas diseases
85. Endocrine part of pancreas diseases with particular focus on neoplasms
86. Peritonitis - etiology, differential diagnosis and diagnosis
87. Cytological assessment of peritoneal effusion

Kidney, urinary and genital system

88. Congenital anomalies of kidneys and genetic kidneys diseases
89. Glomerulopathies: pathogenesis and core needle biopsy
90. Tubulointerstitial kidney diseases
91. Vascular kidney diseases
92. Other kidney diseases associated with systemic conditions
93. Paediatric kidney neoplasms
94. Kidney neoplasms of adults: differential diagnosis and prognostic factors
95. Other kidney diseases
96. Congenital defects of urinary tract and male genital organs

97. Inflammation of bladder
98. Neoplasms of urinary tract – classification, differentiation, WHO 2016
99. Other neoplasms of urinary tract
100. Nodular hyperplasia, inflammations of prostate gland
101. Epidemiology, diagnostics, core biopsy, cytology, prostatic carcinoma
102. Differential diagnosis of other neoplasia of prostate gland
103. Inflammations of testis and epididymis
104. Testicular neoplasia
105. Tumors of male and female genital organs
106. Diagnosis of congenital defects of female genital organs
107. Neoplastic and non-neoplastic diseases of vulva and vagina
108. Endometriosis
109. Non-neoplastic lesions of cervix
110. Cytological diagnosis of cervix
111. Premalignant lesions of cervix
112. Squamous cell carcinoma of cervix
113. Adenocarcinoma of cervix
114. Changes of endometrium in menstrual cycle and cycle disorder
115. Endometrial neoplasms - diagnosis, differentiation, prognosis
116. Smooth muscle tumors - differential diagnosis
117. Fallopian tube pathology
118. Ovary - non-neoplastic lesions
119. Ovary neoplasia
120. Pregnancy and Placenta related lesions: histological diagnosis of ectopic pregnancy and secondary lesions, infections and miscarriage factors, fetal death, gestational trophoblastic disease and neoplasia

Breast

121. Inflammatory regressive changes and proliferative lesions. Differential diagnosis with precancerous changes and carcinoma
122. Breast carcinoma: epidemiology, prognostic factors and diagnosis of fine needle aspiration biopsy material, core biopsies, intraoperative and surgical specimen
123. Other neoplastic and non-neoplastic lesions

Lymph nodes and heamatopathology

124. Lympho-adenitis
125. Hodgkin lymphoma differential diagnosis, classification, prognostic factors
126. Non-Hodgkin lymphomas, genetics, diagnosis, and differential diagnosis
127. Leukemias differential diagnosis, classification
128. Multiple myeloma and MGUS
129. Myeloproliferative neoplasms
130. Myelodysplastic syndromes
131. Reactive/secondary syndromes
132. Anemias, bleeding disorders

Bone& Soft Tissues

133. Morphological differential diagnosis of the main bone diseases
134. Inflammations and degenerative joint disease - differential diagnosis
135. Inflammations and regressive bone changes
136. Bone and joints tumors diagnosis with radiological and clinical correlation. Biopsy specimen, intraoperative and surgical specimen diagnosis
137. Epidemiology, classification and morphological differential diagnosis of soft tissue tumors including immunohistochemistry, electron microscopy and molecular
138. Non-neoplastic soft tissue diseases

Cardio Vascular System

139. Atherosclerosis and coronary heart disease and consequences
140. Morphological diagnosis of the consequences of hypertension
141. Systemic vasculitis and immunopathology of systemic vascular diseases
142. Congenital and acquired defects of the heart and vessels
143. Endomyocardial biopsy in the context of the diagnosis of myocarditis
144. Other inflammatory process of the cardiovascular system
145. Primary and secondary cardiomyopathies
146. Other cardiovascular system diseases

Nervous System

147. Vascular changes of the central nervous system
148. Degenerative diseases of the central nervous system
149. Histopathological diagnosis of intracranial tumors
150. Muscle diseases
151. Inflammatory and non-neoplastic diseases of the eyeball
152. Malignant melanoma, retinoblastoma and other ocular tumors
153. The role of morphological diagnosis in diseases of the auditory organ

Completing the module, the Trainee is expected to master:

1. the efficient performance of a sectional examination and interpretation of the macroscopic changes and tissue preparation for histopathological examination,
2. the proper preparation of the sectional examination documentation,
3. the protection of organs and tissues for forensic medical examinations,
4. the routine biopsy tests (specimens, scrapings, basal biopsies, postoperative materials) and the interpretation of the changes observed,
5. the histological interpretation of changes in materials from sections, thick/fine needle biopsies, postoperative materials,
6. the performance and evaluation of cytological tests (swabs, body cavity fluids, fine needle aspirates, copy preparations),
7. special techniques as histo-immuno-chemistry, electron microscopy, molecular biology (understanding of different techniques, as PCR, RT-PCR, NGS, etc.) in the basic scope and interpretation of test results along with morphologic diagnosis
8. general knowledge of developing new tools (computer-assisted diagnosis)

FORMS AND METHODS OF TRAINING

The Trainee should take courses/workshops on the following topics, preferably external to the PS training site, for minimum of 2 weeks per year of training:

1. **obligatory introductory course**: Introduction to pathology, ethics and law in pathology, bio-banking and pathology department management
2. Course/workshop: basics of oncological histopathology
3. Course/workshop: basics of clinical cytology
4. Course/workshop: gynecology cytology
5. Course/workshop: hematopathology
6. Course/workshop: neuropathology
7. Course/workshop: advances oncological histopathology
8. Course/workshop: advances in clinical cytology
9. Course/workshop: selected elements of pediatric pathology
10. Course/workshop: grossing, standardized protocols for pathology reports, autopsy performing and autopsy protocols
11. Course/workshop: histopathology of bone and soft tissue lesions
12. Course/workshop: lung pathology
13. Course/workshop: ancillary techniques (histochemistry, immunohistochemistry, molecular biology).

Overall, the recommended minimal Number of diagnosed cases is
100 Autopsies
7500 surgical pathology cases
2500 cytopathology cases
50 complete Molecular Pathology Reports

Trainees are encouraged to take complementary learning courses:

1. Flow cytometry: basic use and indications
2. Bioinformatics
3. Radiology-pathology correlation
4. Specific pathology of rare disease
5. Pathology of glomerulonephritis
6. Pathology of interstitial lung disease
7. Pathology of transplantations
8. Pathology of inflammatory skin diseases
9. Pathology of neurodegenerative disease

Internships:

1. Basic internship in the field of pathology (192 weeks)
2. An internship in the field of forensic medicine (10 days/80 hours)
3. Internship in oncological pathology (20 days/160 hours)

Procedures and diagnostic tests

Introduction

This section lists the procedures that a Trainee should be able to “carry out”, appropriately order and interpret:

- Sample reduction
- Gross and microscopic routine diagnoses
- Frozen Sections assessment
- Histochemical staining
- Immunohistochemical reactions
- Molecular analysis and reports
- Cytology smears assessment
- Clinical/Medical Legal autopsies
- Skills in Digital Pathology
- Skills in Informatics
- Electron microscopy assessment

For each procedure, the Trainee should

- know indications
- know contraindications
- be able to systematically and efficiently carry out the procedure, when required
- know the PRE-ANALYTICAL requirements and how to manage them
- know post-procedure and STORAGE & ARCHIVE management

For each diagnostic test, the Trainee should know:

- The best fixation procedures
- The sensitivity and specificity of the devised test
- The potential OVERLAPPINGS and DIFFERENTIAL DIAGNOSES
- The systematically interpretation of results
- Safety requirements.

Clinical reasoning and decision-making

Introduction
Following the acquisition of clinical information and the assessment of the sample, the Trainee must be able to decide which further tests and diagnostic procedures are in the patient's interest, their costs and limit/advantage.

These decisions are based on the complete knowledge of the availability and performance of each test, as well as in the familiarity and competence with the disease and the devised procedure (IHC, EM, Molecular Investigation), bearing in mind their responsibility to the patient collective and the limitations of health care resources.

Professional competency
On completion of training the Trainee is expected to have acquired the following competences:

Organizational Competences
The Trainee must be able to know, organize and intervene on all the steps of the diagnostic procedure to ensure optimal patient care and the safety of the sample, from the

- Able to manage and contribute effectively to a Multi-Disciplinary Team Conference, including the discussion of the best biopsy procedure
- Frozen section or intra-operative cytology
- Sample handling (fresh, best fixation) able to demonstrate leadership and management for the Patients' and Staff safety within the Laboratory settings
- Ability to prioritize needs, allocate resources in term of personnel, equipment, spaces, and anticipate changes in respect to new clinical requests and technology developments
- Operate in the control of Turn Around Time
- Know the procedures for the Quality control of Laboratory output
- Know the procedures for the Quality Assurance with Inter and Intra-Laboratory Quality Assessment
- Know the procedures for the safety of the Archives of Slides, Blocs, Frozen material and Bio-banking, in full respect of EU and National Regulations
- Know the procedures for the safety of digital firewalls, intranet lines, clouds use, passwords regular change, safe and permanent storage of all regulations and security related to patient and administrative data.

Communication & Collaboration
Effective communication, both verbal and non-verbal, is essential for safe patient care as well as for building and maintaining good relationships with patients, relatives and colleagues.

With patients and relatives, the Trainee should use language adapted to the circumstances and confirm understanding, and give special consideration to:

- obtaining informed-consent prior to diagnostic and therapeutic procedures
- informing patients and/or relatives about test results
- involving the patient and/or relatives in decision making
- the challenges associated with language barriers and receptive/expressive difficulties

With colleagues and other health care providers
Trainee should be proficient at working as team-members or team-leaders in multidisciplinary teams, with mandatory participation to tumor board. This competence requires an understanding of the role of colleagues in other specialties, non-technical skills such as situational awareness and the ability to judiciously delegate tasks, and stress

tolerance. Trainee should become proficient at communicating relevant information relating to patient care to other colleagues and health care providers.

With mass media and the general public
Trainee must be able to interact with the mass media in a constructive way, giving correct information to the public through the local hospital communication process while respecting patient and staff privacy.

Trainee must be able to communicate in a professional and constructive manner, orally or in writing, when conflicts arise between patients, relatives, caretakers and/or health care personnel.

Documentation
Trainees are responsible for clear, legible, accurate, and complete reports where the author, date and time are clearly identified. Documentation is a continuous process and all entries must be made in real time. Diagnostic reports include:

- relevant past medical history and physical findings
- relevant previous tests results
- gross description
- microscopy description with results of complementary test HC/Molecular tests
- diagnosis and differential diagnosis
- clinical and pathological comment and eventual plan for further investigations

Education & Research
Reflective practice & self-education
Trainee must continuously reflect upon their own clinical practice, identify gaps in knowledge and competence, through self-education, and be aware of the value and limitations of various educational modalities.
Participation to Meetings, Courses and Congresses is strongly recommended.
It is strongly recommended to take part in research activities and scientific publications.

Teaching & mentoring
Trainee must be able to teach Pathology to undergraduate, graduate health care personnel, within the classroom as well as within the clinical setting. In particular, Trainee must be able to supervise more junior staff and promote competence development through questions, guidance, feedback and reference to educational material. Trainee must continually reflect upon the teaching process and develop their pedagogical skills.

Critical appraisal
Trainee must be able to systematically search the medical literature to answer specific clinical questions, critically studies, and determine whether these studies ought to impact on local practice according to the principles of Evidenced-Based Medicine.

Health Care Evaluation & Improvement
Trainee must be involved in the evaluation and improvement of local health care processes.

Quality standards, audit and clinical outcomes
Trainee should recognize the value of quality standards and the benefits of measuring key performance indicators to improve patient care. They must be able to complete an audit cycle and use clinical outcomes, including critical incident reporting, in order to continuously improve clinical practice through actions with demonstrable outcomes that can be measured against performance indicators.

Critical incident analysis
Trainee should be able to recognize when care/diagnostic process has been unsatisfactory, complete a report that accurately describes the events and patient outcomes, contribute to the analysis of the reasons for the unsatisfactory care, and determine which actions can be taken to decrease the risk of repeat events. Trainee should be able to contribute to morbidity and mortality conferences.

Knowledge translation
Trainee should be able to design, implement and evaluate programs that introduce new health care processes locally.

Professionalism, Ethics & Medico-Legal
Trainee must operate within the legal framework of the country in which they are working. Yet, the law does not always provide the answer to many ethical problems. In these circumstances, Trainee must be able to produce a reasoned analysis based on ethical principles to determine moral duty, obligation and conduct (medical deontology).

Professional behavior and attributes
Trainee must be able to work professionally and efficiently with a diverse patient population under stressful circumstances; must be aware of their own limitations, recognize their own errors and value participation in the peer review process.

Colleague in difficulty
Trainee must be able to support colleagues in difficulty, know how to access support to improve resilience.

Patient confidentiality
Trainee

- must understand the legislation regarding patient confidentiality and data protection (Autonomy, informed consent & competence)
- must respect the rights of competent patients to be fully informed about the aspects of their care, to be fully involved in decisions about their care, and to refuse clinical procedures or treatment
- must understand when and how to use advance directives such as living wills and durable powers of attorney
- must be able to assess whether a patient has the competence to make an informed decision.

Forensic Issues
Trainee should be aware of the relevant legislation in the country of practice regarding the preservation of forensic evidence. They should be able to document and appropriately handle evidence suggesting abuse, neglect or crime.

Health Advocate
Trainee should advocate healthy life-styles and where appropriate lobby for health of the population and sustainability of the health care system.
should adopt life-style practices to maximize their own resilience and lobby their institutions and employers to improve their working environment in order to maximize their own resilience and those of their colleagues.

Continuous professional development
Trainee must continue to develop their knowledge and practice by continuous education. They must identify for personal improvement and learn to apply scientific evidence and advances to improve patient care.

Utilization of technology and information management
Trainee must understand the role of technology in delivering safe healthcare and the utility of data to manage resources and support innovation.

Level of competence expected
Trainee will progress in competence from a novice to expert and in being able to recognize a clinical condition or problem to being able to independently provide definitive treatment. There will also be progression in skills in managing time, multi-tasking, supervision, leadership and other core professional skills. In this regard 5 levels of competence are recognized:

- Level 1: recognize the general organization of the Pathology Department, assist experienced Residents and Laboratory Technicians, observing the activity
- Level 2: manage simple conditions independently, acting with direct supervision present in the room
- Level 3: manage more complex gross reduction, with supervision
- Level 4: manage the majority of gross independently and undertake microscopy reading, unsupervised, with tutor immediate proximity
- Level 5: provide guidance and leadership to others and supervise younger Resident activities.

Entrustable Professional Activities (EPA)
By definition, EPA are all those units of professional practice that may be entrusted to a Learner, to execute unsupervised diagnostic and technical decisions, once he/she has demonstrated the pertinent required competence. These acts require trust either by Colleagues, patients, and the general public, with the relevant meaning from individual competence to the work that must be done.

The Trainee Competencies have been extensively herein reported and can be summarized in theoretical and health system knowledge, technical skills, communication and management ability, and professional attitudes. The general qualities that enhance trust are Ability (skilfulness and experience), Integrity (truthfulness, benevolence), Reliability (conscientiousness, stable behaviour), and humility (observe own limits, willing to ask help). All these are personal characteristics of each subject, but all of them can be cultivated and improved.

The EPA are work descriptors of essential professional practice that in Pathology are

- Simple, rapid report (effectively and timely reports)
- Clear conclusions (Interpret, synthesize, and summarize knowledge)
- Continuous relationship with other Colleagues of the diagnostic area (laboratory Medicine, Imaging, interdisciplinary team, gives and receives feedbacks, ethical behaviour)
- Continuous relationship with patient Physician (Responsiveness to patient’s needs)
- Clear relationship with the patient’s Family.

The EPA for Pathology Graduate Medical Education are reported in the following Table from the paper by Cindy McCloskey (McCloskey, Cindy B et al. “Entrustable Professional Activities for Pathology: Recommendations from the College of American Pathologists Graduate Medical Education Committee.” Academic pathology vol. 4 2374289517714283. 27 Jun. 2017):

1. Perform gross dissection of simple and complex specimens (AP)
2. Compose a diagnostic report for surgical pathology specimens (AP)
3. Perform intraoperative consultations and frozen sections (AP)
4. Compose a diagnostic report for cytology specimens (AP)
5. Perform adequacy assessment/rapid interpretation for cytology specimens (AP)
6. Perform fine needle aspiration (AP)
7. Perform a medical autopsy (AP)
8. Compose a diagnostic report for clinical laboratory testing requiring pathologist interpretation (CP)
9. Evaluate and report adverse events involving the transfusion of blood components (CP)
10. Evaluate and report critical values in the clinical laboratory (CP)
11. Perform other procedures, for example, bone marrow aspiration and biopsy, apheresis (CP)
12. Provide guidance for the resolution of preanalytical testing issues (AP/CP)
13. Provide pathology support for interdisciplinary conferences (AP/CP)
14. Provide patient care consultations (AP/CP)
15. Optimize test utilization (AP/CP laboratory management)
16. Improve quality and patient safety (AP/CP laboratory management)
17. Evaluate and choose a new test or instrument (AP/CP laboratory management)
18. Implement a new assay or test system (AP/CP laboratory management)
19. Perform a laboratory accreditation inspection (AP/CP laboratory management)

Abbreviations: AP, anatomic pathology; CP, clinical pathology.

And EPA for patients care consultation:

Description and tasks	Pathologists are able to provide timely and effective verbal or written clinical consultations in response to clinical provider inquiries. Knowledge and skills required include the ability to: 1. Define the clinical question posed by the consultation request 2. Evaluate patient clinical history, signs and symptoms, ancillary findings, and laboratory tests pertinent to the consult request 3. Review the literature and identify outside resources necessary to manage the clinical consultation 4. Prepare a differential diagnosis and generate recommendations to address the consultation question 5. Communicate the results of the consult verbally and/or compose a written report documenting the findings and recommendations as appropriate 6. Hand off information to a responsible technologist or pathologist as appropriate for consult requests that cannot be resolved in the time frame available 7. Follow-up as needed on handoffs or unresolved issues regarding the clinical consult, including monitoring patient outcomes and addressing any laboratory issues related to the consult

Evidently enough, a standardized workplace-based assessment is necessary, with the power to discriminate between individuals, and with reproducible scores. For this reason, the UEMS Pathology Section has signed a MoU with the European Pathology Scientific Society (ESP) in order to coordinate the activities and to specifically produce a Progress Test.

Organization of training

Schedule of training
According to the EU-directive 2005/36 /EC the minimum requirement of training to be recognized Pathologists as a primary specialty is 4/5 years of full-time training, in Pathology Department supervised by trained Pathologists or approved trainers (see below), where the workload is between 30-35,000 cases/year and where the full range of cases is received and which includes the care of adults and children (see below).

The trainee will acquire competences by deliberate practice in a Pathology department, and from supervision and feedback from senior PS. In addition, time will be spent in formal educational setting (classroom teaching), self-directed learning and on formal courses. The trainee will need to have allocated time to develop professional competences including academic, quality improvement and educational skills.

Within the program, a trainee must be evaluated at the end of each year and a personal learning program devised that allows the trainee to acquire skills and competences not yet achieved.

Curriculum of training
This ETR is the standard curriculum for Europe. The list of competences above forms the basis of the syllabus within the curriculum. Many countries in Europe have modified the European curriculum for the purposes of the specialty training in that country.

Documentation and assessment of the trainee including assessment of progress
Documentation
A portfolio based on the core curriculum must be used for assessment. The purpose of the portfolio is to demonstrate progression against agreed educational objectives and coverage of the curriculum.

There is no European portfolio at present for Pathology: countries have developed their own portfolios, but the following are the mandatory elements

- A log book of experience, clinical cases and procedures
- Documentation of workplace-based assessments
- Personal reflections on learning
- Personal development plans
- A record of the review of progression by the supervisor
- Certificates of courses and successful examinations

The progress should be formally monitored by the program lead, at least annually, by review of the portfolio and documentation of the discussion of progression should be included in the portfolio.

Assessment
Formative assessment
Formative assessment is used as part of an ongoing learning or developmental process in giving feedback and advice. It must provide benchmarks to orientate the trainee. These benchmarks must include evaluation of the non-technical skills defined in the curriculum as much as technical expertise.

It must evaluate the trainee's progress and identify the strengths and weaknesses of that individual. The evaluation and any recommendations must be fully shared with the trainee.

Part of formative assessment:
Formal Documentation of trainee's development and progress after review of evidence collected.

- Workplace based Assessments
- Observed clinical and pathology reports of unselected cases during working time including team behaviors, communication, and non-technical skills
- Direct Observation of Procedural Skills, to assess the knowledge, procedural and practical skills and attitudes of the trainee's interaction with a co-workers and laboratory staff
- Case-Based Discussion, to explore clinical reasoning on a recent case
- Record of participation in Journal Club
- Record of courses
- Record of e-learning completed
- Record of teaching received
- Record of teaching delivered with feedback
- Academic activity including critical appraisal, original research, editorial activity

Summative assessment is usually a formal assessment that takes place after a specified training period with the purpose of deciding whether the trainee has reached a standard to proceed to the next level of training or to be awarded a certificate of Completion of Training. The methods of summative assessment should include:

- Written examinations (multiple choice questions, short open answered questions, essays)
- Oral and practical examinations
- Evaluation of trainee's Portfolio and confirmation of appropriate progression
- The Section and Board recommend that the European Board Examination in Pathology is adopted by all European countries as the final assessment of competence to promote freedom of movement of specialists in Europe.

Assessment of progress

Specialist education and training must include continuous assessment which tests whether the trainee has acquired the requisite knowledge, skills, attitudes and professional qualities to practice in the specialty of Pathology. This must include formal annual and final evaluations. The annual evaluation must formalize the assessment of a trainee's competence to promote the trainee's improvement.
Final completion of a training program should be dependent upon review of the trainee's portfolio as well as success in the final examination. The Training program director must provide an overall judgment about the trainee's competence and fitness to practice as an independent specialist in Pathology.

The Board of the UEMS Section of Pathology proposed the following Assessment Protocol:

First Part (Theoretical)

- 100-300 Questions Multiple Choice
- 10 Gross description & Reducing Tech and modalities

Second Part (Practical) based on **VIRTUAL SLIDES and CASES**

- 5 PAP Gynaeco-Cytopathology Conventional smears
- 5 Effusions
- 5 FNA
- 15 Complete Surgical Pathology Report (5 Oncology, 5 Reactive/Inflammatory, 2 Autopsy Slides, 3 Molecular Data Interpretation)

Pass rate will employ the Angoff method, which calculates a cut-off mark based on the performance of candidates in relation to a defined standard (absolute) as opposed to how they perform in relation to their peers (relative). It involves a judgement being made on exam items (test-centred) as opposed to exam candidates (examinee-centered).

Fields of Special Interests (so-called Sub-specialties)

Pathology is the branch of Medicine dealing with the diagnosis of diseases, which means knowing and doing almost everything in Medicine, except prescribe drugs and therapies, but suggesting the best therapy conduct and scenario to our Colleagues. In this context, there are obviously several subjects which require special attention and competence, for which it would be reasonable for a Pathology Resident to obtain a formal competency certificate after the final degree, but only in the framework of Pathology Specialty.
6-12 months should be dedicated to the field of special interest, during histopathology training, with optional additional training for those wanting to carry out independent practice, for which formal accreditation will be mandatory for independent practice. When necessary, frequency and visits to centers of recognized practice should be available to trainees.
Syllabus and ETR are demanded to each Sub-Specialty Conference (ESP Working Groups).

Molecular pathology

Molecular approach is a modern method of investigating biological material and as such many different professionals have developed their skills in different subjects. But when it comes to human disease, Pathology has its main, unique and unopposed role, since no one except PS can be considered responsible for the exact definition of the nature of cells/tissue/organ where the molecular investigation has been carried out.
Molecular is a relatively new subject in Pathology, but of which all PS are obliged to know use, finality and procedure.
Molecular investigation is not and cannot be everywhere available, due to the high cost and expertise in handling and interpretation, but all PS should be familiar with all the pre-analytical procedures, preservation, and nucleic acids isolation methods from any kind of sample (fresh, FFPE, frozen, cytology, non-cellular fluids).
PS not directly involved in Molecular Path are asked to find and choose a “Expert” Colleague in a qualified center to refer and to work with and send out diagnoses completed with his opinion, interpretation and conclusion on molecular results.
What all PS are obliged to know is when and where molecular investigation are required, e.g. for Paediatric genetic, in oncology, in rare diseases.
The continuous development in molecular pathology and the related clinical applications force the PS to a constant update.

Forensic Pathology and Autopsy

Second Opinion on surgical pathology or cytopathology cases with/without litigation: if asked, a PS will give his/her opinion on a case submitted by a Colleague for a second opinion, for the sake and safety of the patient and of the Colleague.
If the request comes from Court or from a lawyer in case of dubious or wrong diagnosis, the PS should act in the name of justice, with respect to deontology and to Colleague and collegiality.

Autopsy: the number of autopsies has seen a steady, but continuous decrease in the last decades both in Europe and in United States and Canada, due to the high costs, the almost complete information provided by imaging and clinical chemistry, and by the limited interest of PS. Nevertheless, the Autopsy maintains high value for Didactic activity for Students and Surgeons, Evaluation of therapy effects, Evaluation of disease progression, Quality control of overall hospital efficiency.
The expected number of Autopsies should be from 5 to 10% of all hospital deaths; for teaching/university hospitals 10% is recommended.

Diagnostic autopsy

All Trainees should have basic autopsy practice competences. These competences will come from apprenticeship training, reading, formal tuition and the practical experience from the minimum of 100 adult autopsies. Ideally, most of these autopsies should be diagnostic clinical autopsies (non-forensic), where all kind of analyses, mostly histopathological, need

to be pursued to explore the pathologies and pathogeneses that lead to death.
Prior to entering the autopsy theatre, the PS must read and understand the current policy in relation to consent for autopsies, for tissue/organ retention, tissue/organ donation and the legal basis of consent (and the circumstances in which consent is not required) to autopsy.
PS must be aware of, and able to apply, relevant protocols and documentation of departmental working practices as well as the practicalities of mortuary practice.
PS must possess a profound understanding of the pathological basis of disease and the macroscopic/microscopic pathology of various types of death, as well as knowledge of basic standard of practice in the techniques used to identify morphological abnormalities at autopsy. PS has to acquire the necessary manual dexterity sufficient to perform autopsies safely and to demonstrate the major abnormalities in a variety of situations, such as cardiac disease, endocrine/metabolic death, CNS disease, intra-abdominal disease, respiratory disease and many others. A capacity to describe the autopsy histological appearances of various common fatal conditions, identification of areas of microbiology, haematology, biochemistry, medical and molecular genetics as well as other investigative modalities relevant to autopsy practice is indispensable.
Last but not least PS need to acquire the ability to interpret autopsy findings in the context of past medical history and clinical progression of disease and possess the necessary communications skills in order to inform clinical Colleagues, assist in multidisciplinary mortality reviews and inform the Family of the deceased.
The availability of autopsy training opportunities is very variable. Thus, the significant role of educational supervisors and program directors in ensuring adequate experience for all trainees.

Paediatric autopsy
As not all departments have a specialized pathologist in the field of paediatric and fetal pathology, PS should have knowledge of, and the ability to perform, autopsies in a variety of situations, such as the early foetal loss, spontaneous mid trimester abortions, termination of pregnancy in cases of foetal malformations, late stillbirth, intrapartum death, sudden unexpected death in infancy and other causes of death with or without associated malformations. Thus, a precise knowledge of anatomy, fetal and infant development, placental pathology, macroscopic features of major disease processes and common dissection techniques relevant to foetal/paediatric autopsy are mandatory.
Basic standard of practice in body measurement, assessment of growth and the techniques used for identifying morphological abnormalities at autopsy are indispensable. A part from a knowledge of the pathological basis of disease in the paediatric age group in general, a deeper insight into iatrogenic diseases relevant to the management of paediatric in relation to neonatal intensive care and paediatric oncology is essential. Furthermore, it is vital to have knowledge of the patterns of fatal non-accidental injury in children.
The availability of autopsy training opportunities, especially in the foetal and paediatric field, is very variable. Thus, the significant role of educational supervisors and programme directors in ensuring adequate experience for all trainees.

Paediatric pathology
Paediatric pathology is also an area of focused attention for which many experienced pathologists have devoted their professional life. Indeed, as for gender, age related diseases are of interested as to claim a recognition “per se”. As for Paediatric Autopsy (see above), there are at least three areas that require centralization of the cases where a trained PS can show detailed expertise, namely **a.** Malformations, genetic diseases and counseling, **b.** Infectious diseases, and **c.** Oncology.

Dermato-pathology
Every year first day of December, in Frankfurt, there is the opportunity to undergo an exam in Dermato-pathology. This is produced and organized by a group of experts in the field of Dermatopathology (for both Dermatologists and Pathologists), offering a Diploma or a

Certificate of Competence, and is open both to Pathologists and Dermatologists with special pre-requisites. This UEMS Section of Pathology strongly suggests that only PS will undergo the Frankfurt Assessment and that non-pathologist Physician should demonstrate a period stage in a certified Pathology Department.
At present the joint UEMS Documents recommends a 6-month period (in addition to the Dermatopathology training). In Austria at present Dermatologists with interest in Dermatopathology should spend 6 months at a Pathology Department (plus 18 months Dermatopathology in accredited Centers) to get the Certificate of the Austrian Medical Council. US Certification in Dermatopathology requires a residency training in Dermatology or in Anatomic Pathology. Thereafter, an additional 1 year of post-residency education in dermatopathology is undertaken (in an accredited Center). Effective July 1, 2011, four months of the one year program will be devoted entirely to dermatopathology, while for the remaining eight months, 50% of each day (averaged over one week) will be devoted to education in either anatomic pathology or clinical dermatology, depending upon the fellow's background (that means, 4 months general pathology for dermatologists and 4 months dermatology for pathologists).

Cyto-pathology
For all PS the complete knowledge of cytopathology is a mandatory item, since Cytopathology is an essential part of PS curriculum and at least 30-40% of everyday workload is represented by cytologic material. However, in recent years, the scientific progress has defined a clear change from the sixties when PAP TEST was the diffuse screening method, with the need of recruiting non-medical cyto-technologists or other non-medical figures for the smear readings. With the introduction of molecular HPV PAP test ha became a second level diagnostic tools, with no need for screening, but increased level of diagnostic competency. Instead, we are facing the need of a more specific figure of PS, devoted to the direct contact with patients directly performing the needle aspiration, or indirectly in close contact with other Specialists, mainly Radiologist, to obtain diagnostic material under ECHO or CT guidance from different organs, mainly, thyroid, nodes, breast, lung, pancreas.
However, while these activities and specific skills are individually well recognized, no formal training or title is present at any national level. Our overseas Colleagues from the United States and Canada have organized “areas of focused attention” with specific training requirements and “steps” in skill, comprehending the scientific, communication, technical and managerial areas. In Europe, only EFCS has been able to organize successful “Tutorials” for 50 people every year, but nothing else has been done, although there is the need for a specific formation period for the PS who has successfully finished his training.

Cardio-vascular Pathology
Cardiovascular pathology (CVPath) refers to the study of the diseases of the cardiovascular system, either acquired or congenital, through morphological modifications occurring in the heart and vessels, observed at macro- and microscopic inspection. It requires both clinical education and expertise in contemporary physiopathology. The 2010 consensus statement on training in CVPath was the result of collaboration between Cardiovascular Pathology Societies, based in Europe and North America. It included a detailed curriculum and described three levels of expertise: Level 1 was the minimum training in CVPath for pathologists working in hospitals with neither cardiac and vascular surgery nor interventional cardiology; Level 2 is recommended for a PS working in a hospital with Cardiac and Vascular Surgery facilities and/or Interventional Cardiology; Level 3 is that of PS with a full-time position in an academic medical center or a specialist cardiovascular hospital and acting as core lab/Hub center for other hospitals. They have a major commitment to cardiovascular pathology, with the skills described for Levels 1 and 2 above, but with enhanced clinical and pathological experience and expertise, including electron microscopy and molecular techniques. Expertise in the study of the conduction system by serial section techniques, ablation procedures and their consequences, and the pathological examination

of devices implanted for rhythm and conduction disorders are mandatory, as well as examination of ventricular assist devices, their complications and interaction with their manufacturers. Fetal and paediatric cardiology, paediatric cardiac surgery and adult congenital heart disease are likely to be part of the clinical service in tertiary centers. Expertise in handling and interpretation of diagnostic endomyocardial biopsy is expected as well as knowledge of genetic cardiovascular disorders. The study of sudden death requires specific expertise at referral center including “molecular autopsy” and multidisciplinary teams.
CV pathologists are physicians who have certification in AP, and who have undergone additional years of training in cardiovascular pathology.

Neuro-pathology
Neuropathology refers to the study of diseases of the central nervous system (CNS) and adjacent anatomical structures, the peripheral nervous system (PNS), and skeletal muscle. The core competencies of fully trained Neuropathologists include autopsy examination, together with microscopical examination and diagnosis of CNS, PNS and neuromuscular disease (augmented by modern molecular pathology techniques) in adults and children. Neuropathologists may have additional training and competency in ocular pathology although it is recognized that this specialist field is also practiced as a mono-specialty interest in some European countries.

Neuropathology has achieved specialist status in some European countries where assessment and accreditation are well developed. In some other countries there are similar training pathways and mechanisms for assessment of competencies and accreditation in the context of subspecialty status. However, in many European countries there is no formal training pathway and no mechanism whereby aspiring Neuropathologists can achieve formal recognition of their specialist competencies.

Neuropathology is a component of clinical neuroscience based on the application of methods common to anatomical pathology/morbid anatomy and histopathology. Neuropathologists therefore require core competencies and training in these disciplines, and core knowledge of general and systemic pathology, together with enhanced training in the clinical pathology of neurological and neurosurgical disease. In addition, Neuropathologists require broad knowledge of clinical (including imaging) neuroscience so that training is best delivered within the environment of specialist Clinical Neuroscience Centers. Neuropathology is a subspecialty that evolved from both histopathological and clinical neuroscience roots. Reflecting this, current neuropathology practice across Europe includes medical practitioners whose basic training was in pathology and those whose basic training was in a clinical neuroscience specialty. Neuropathology training, in terms of the development of high-level competencies in diagnostic practice, has of necessity been adapted to the differing needs of entrants, some (coming from clinical neuroscience) requiring training in core pathological knowledge and skills whilst others (coming from core pathology training) requiring training in clinical neuroscience.

European countries in which formal neuropathology training pathways exist generally require a period of at least 3 years of subspecialty training in addition to any previous training in general pathology of clinical neuroscience.

Co-ordination and fostering neuropathology practice, training and assessment has been a core mission of the European Confederation of Neuropathological Societies (EuroCNS). In particular EuroCNS recognized the lack of assessment opportunities for neuropathology across most of Europe. It therefore developed the European Fellowship in Neuropathology (EFN) examination that is delivered annually. The examination is largely informed by, and at the standard of, the UK Royal College of Pathologists Fellowship part 2 examinations in Neuropathology. EFN, under the supervision of the EuroCNS Examination Committee, is

delivered by selected major European neuroscience Centres. It is a single examination, over two days, and integrates both some assessment of knowledge, and multiple modules requiring the demonstration of high-level competencies (neurosurgical diagnosis, intraoperative diagnosis, neuromuscular pathology, paediatric neuropathology, morbid anatomical dissection of the brain and the interpretation of macroscopic appearances in brain tissue). Candidates are required to demonstrate and document an appropriate period of neuropathology training before they are accepted for examination. Over 12 years the pass rate is around 60% and 19 European Fellows in Neuropathology have successfully achieved a pass in the examination.

It must also be recognised that elements of Neuropathology, especially diagnostic surgical neuro-oncology or neuromuscular pathology, are delivered in some European centres as a subspecialty interest of general histo-pathologists or neurologists who have not undergone any formal assessment of their competency. Whilst the EFN examination contains distinct modules as listed above these are not individually available to candidates who must sit the entire examination.

Applications of advanced molecular pathology data, including genetic data, have become central to neuropathological diagnosis. Neuropathology training and competencies must therefore include appropriate knowledge and understanding of these data, and their commissioning, and the ability to synthesise multiple data modalities in the process of integrated reporting.

Paleopathology

Far from being anecdotal or the occupation for retired Academics, with the introduction of new technologies, Paleopathology has become of the utmost interest from the study of disease evolution (pathomorphosis and morphological appearance), as well as for alimentary, occupational and microbiological modification along centuries. The relations between man, animals and the environment (pathocenosis) allow the whole reconstruction of the history, distribution and prevalence of diseases. The methods of obtaining Ancient DNA from bones, teeth and other remains has opened fascinating new horizons on human occupation of the Planet.

TRAINING REQUIREMENTS FOR TRAINERS

Definitions of trainers

The faculty is defined as all senior physicians and healthcare professionals who contribute to the training of the trainee. Faculty is composed of:

Training program directors (TPD) who supervise a training program, ensure quality of trainers and training placements and coordinate placements to ensure trainees achieve the correct experience

Educational supervisors who provide ongoing individual professional development advice, monitor progression, provide placement reports on an annual basis and who are responsible for a limited number of trainees. Each trainee should have a named educational supervisor who provides advice and support over an extended period in one or more placements

Clinical supervisors who provide support in patient contact activity – giving clinical advice and maintaining standards of care for patients. Clinical supervisor supervises multiple trainees at one time, and the activity is usually within their clinical time. Clinical supervisors may undertake workplace-based assessment as part of the clinical supervision.

All physicians should participate in practice-based training as emphasized. Trainers should receive training for their educational activity and demonstrate ongoing regular professional development in educational matters.

Requirements for trainers

The faculty for Pathology must include a TPD and an appropriate number of trainers. Trainers should devote a large proportion of their professional efforts to training and should be given sufficient time to meet the educational requirements of the program.

This is likely to be at least 1 hour per week for the educational supervisor for each individual trainee in addition to the contact time in clinical working.

Training program director

The Training Program Director must be an experienced specialist in Pathology. The Director must be approved by the National Training Authority and fully direct the Training Program.

Trainers must be accredited or selected by the TPD and accept responsibility for the day-to-day supervision and management of trainees as delegated by the TPD.

Clinical and educational supervisors

Clinical and educational supervisors must be Pathologists and/or a technical specialist who is in practical Pathology. There must be a sufficient number of trainers in the Pathology Department to ensure adequate diagnostic and technical supervision of trainees as well as efficient, high quality organization.

Evaluation of trainers

The Training Program Director must evaluate trainer performance at least annually. This appraisal should include evaluation of teaching ability, clinical knowledge, professional attitude and academic activities. Trainers should be supported in developing their supervisory skills.

TRAINING REQUIREMENTS FOR TRAINING INSTITUTIONS

Criteria for recognition as training center/program

Requirement for staff and clinical activities in a net-work
There must be a minimum number of undifferentiated new entries (cases) from a minimum of 15,000/year for a training department. This number should include children under 16 years of age in order to provide experience to maintain skills.
The case mix in a training department should reflect the presentations and conditions in the syllabus. If a center does not see an appropriate case mix, a program of rotational posts between relevant center or an alternative method for gaining practical experience must be in place.

The ratio of trainers to the number of trainees must be sufficient to allow training to proceed without difficulty and to ensure close personal interaction and monitoring of the trainee during their training. The recommended optimal trainer/Pathology trainee ratio is 1 to 2 within a department.

An appropriate supervisor should be present for a minimum of 75% of the clinical working hours of the trainee and that there should be a supervisor available for immediate advice at all times. Indirect clinical supervision (supervisor immediately available for advice) is recommended for senior trainees only. Junior trainees may be clinically supervised by appropriately experienced senior trainees as part of the senior trainee development providing there is adequate indirect clinical supervision available.

Departments should consider the working environment and conditions and the impact of this on learning opportunities. Pathology imposes an intense workload on the staff and appropriate time between shifts, rest breaks within a shift and annual leave arrangements must be provided to ensure trainees are able to learn and develop their personal skills. Appropriate rest areas within a department and access to refreshments are part of the training environment.

A department is expected to undertake quality improvement activity such as audit, oncological multidisciplinary meetings, performance monitoring and serious adverse incident investigation. In addition, there should be a named trainer responsible for training in scientific methodology including critical appraisal and statistical analysis.

To keep the teaching and learning process on appropriate level, for one senior pathologist there should be no more than 2/3 Pathology Residents.

Requirement for equipment, accommodation and facilities in a center
The department must provide accommodation for trainees which includes access to:

- Sufficient formal training space with projection facilities, access to the internet and audio-visual equipment
- Office space for trainees to carry out quality improvement and scientific activity sufficient computers to allow for private study
- internet access for clinical decision support in the clinical area
- access to academic library
- sufficient clinical equipment to allow trainees to deliver safe patient care
- rest facilities providing food and hot drinks 24/7 and separate quiet space

Structure for coordination of training within a program
There will be central coordination of the training program within a country. Where there is only one institution delivering the training program this will constitute the central coordination and will give advice to other institutions who wish to commence a program.

The UEMS Section and Board will receive reports on national training programs on a yearly basis including the number of accredited training places, training placements, trainees enrolled on programs, expected progression, attrition rate and appointment to specialist positions. The success rate at the EBEEM and national examinations will be compared and monitored.

Quality Management within Training programs

Criteria for training center
Training should generally be carried out in university hospitals or affiliated teaching hospitals although some training can take place on rotations in general hospitals or the community/pre-hospital environment providing case-mix and supervision is adequate (as above).
Each training institution should have an internal system of medical audit or quality assurance, including a mortality review process for reporting adverse events.

The curriculum should be delivered through a variety of learning experiences. The foundation of postgraduate education in Pathology is predominately experiential training in conjunction with formal teaching sessions with the aim of integrating theory and clinical activities.
The trainees should be given opportunities for self-directed learning and professional development with agreed learning objectives and goals for the learning period.

The structure of rotations should reflect the needs of the service, the educational needs of the trainee and the safety of all.

Clinical supervision should be sufficient and balanced according to the experience of the trainee with increasing clinical independence and corresponding acceptance of responsibility.

Evaluation of training centers
Training Centers must be evaluated in accordance with national rules and EU legislation as well as UEMS recommendations. Where there are no national standards, the Section and Board recommend standards defined by relevant UEMS bodies (NASCE/CESMA). Evaluation must also consider the spectrum of services within the hospital.

Evaluation of training program
Regular internal and external evaluation of the Training Program must be assured in a systematic manner both as regards adherence to the curriculum and the attainment of educational goals. Both trainees and trainers must have the opportunity to evaluate the program confidentially and in writing at least annually. External evaluation may be requested to the Section and Board (at the expense of the local organization).

Accreditation of training centers/program
At the national level a standardized process of accreditation should be in place.
In Europe, a training center/program would be recognized by the UEMS Section and Board for Pathology if the center complies with the following:

- it is recognized by the national competent authority as a formal training center in Pathology in that country
- has a training program that is in accordance with the European curriculum

- submits a 5-yearly self-evaluation of the training program according to certification guidelines (to be developed)
- submits the training program and its assessment system for approval by the Section and Board
- the accreditation should be repeated at least every 3 years

Work-force planning

It is expected that national societies work with the competent authorities in the country to determine the manpower required for the specialty. This will include consideration of the utilization of a multi-professional workforce and take into account the requirements of pre-hospital Pathology as well as the in-hospital provision of care.

The development of training programs and the training placements is expected to be matched to the likely demand for specialists to ensure appropriate supply of trained specialists in Pathology.