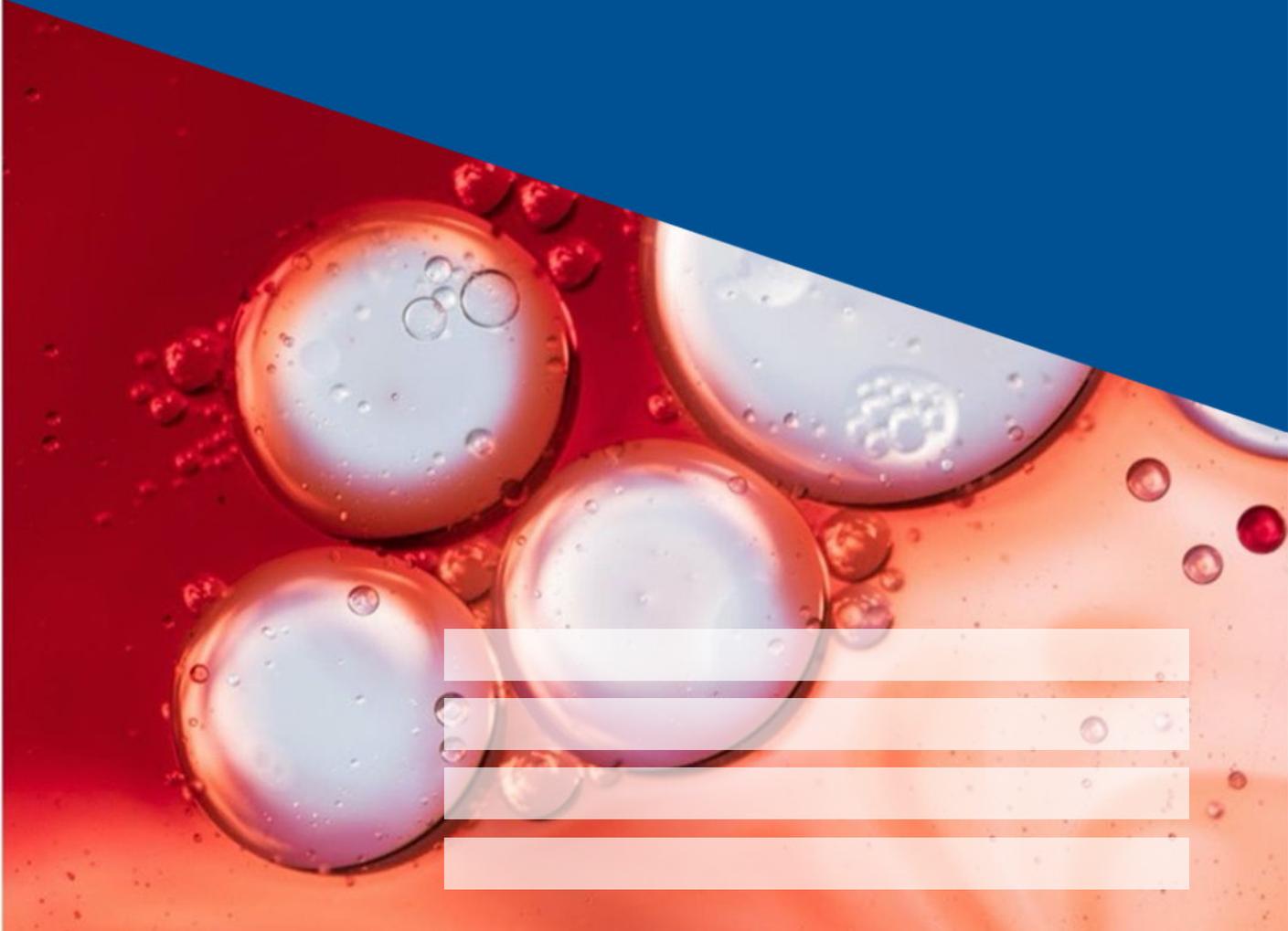


EUROPEAN HEMATOLOGY CURRICULUM 2023



FOREWORD

Since 2006, when the first version was launched, the European Hematology Curriculum has been developed as the backbone of the EHA education activities. The Hematology European Exam, the Progress Test and all the activities on the EHA campus have this tool as the basis for their development.

The Curriculum comprises all the areas that Hematology covers as a medical discipline, being aware that the entire content is not required in all countries. The level of knowledge for each topic expected from a Hematologist who has finished the training is also included. Considering the lack of homogeneity throughout Europe, the aim is to harmonize what is required in the countries that endorse the curriculum, trying to find the common knowledge that can be demanded at the European level. This is an especially important issue as one of the aims of the Curriculum is to serve as a tool to facilitate mobility. The present fourth version is the fruit of the work of 16 hematologists, experts in the different fields of Hematology, who worked combining online and onsite meetings during the fall of 2022. The Curriculum comprises 8 sections, following the structure of prior versions. Each section has been reviewed and updated. New topics have been added, incorporating the new knowledge, diagnostic tools and novel treatment modalities that have been developed in the last years. A recommendation for the length of training in Hematology and a detailed description of the level of competence are also included. The Curriculum also aims to serve as a self-assessment tool for trainees and hematologists who want to find out their knowledge gaps and help them in their continuous training. Finally, I would like to thank the Education team of EHA for their contribution to the success of this project and the 27 National societies for their inputs and their endorsement.

I expect that the European Hematology Curriculum version 4 will continue serving as the basis and backbone of the EHA education activities as well as a tool for self-assessment. Enjoy it!

José Tomás Navarro Ferrando
Chair, EHA Curriculum Committee
Chair, EHA Curriculum Update Group

I) Recommended length of training

Automatic recognition of professional qualifications across EU Member States, based on enhanced and harmonized minimum training requirements, is of crucial importance for the mobility of hematology professionals and, ultimately, for safeguarding the quality and safety of patient care. Given the wide scope of the discipline of hematology, as described in the Hematology Curriculum, EHA recommends a minimum training requirement for Hematology of five years, or three years when previous training encompassed the equivalent of at least two years in internal medicine.

II) Structure of the Curriculum

The Curriculum is composed of eight main sections divided into subsections fitting into one of these categories:

- Clinical skills
- Laboratory skills
- Competences related to regulations and principles

Each one of these sections is composed of topics in hematology that are assigned a recommended competence level according to endorsed European standards.

III) Instructions to undertake the self-assessment

In order to complete the self-assessment, work through each section, select the level that most closely represents your current level and enter your responses.

You will be able to see the recommended level of each topic and compare them against your responses, and in doing so identify your strong points of knowledge in hematology as well as learning opportunities in the topics wherein you need to enhance your skills.

Levels descriptor

Level 1

I am confident I can:

Clinical skills (patient management and treatment)

- Describe the clinical features and epidemiology of a condition OR indications for a specific treatment/procedure OR appropriateness/utility of a test
- Recognize a patient who may have this condition OR require this treatment OR benefit from this test

Laboratory skills

- Recognize the appropriateness and utility of a specific test for diagnosing and follow-up of specific hematological conditions

Competences related to regulations and principles

- Identify applicable regulations OR principles

Level 2

I am confident I can:

Clinical skills (patient management and treatment)

- Describe the pathogenesis
- Identify clinical features and investigations required to diagnose condition and interpret test results correctly
- Describe prognosis
- Identify correct referral routes OR initiate appropriate treatment (according to established protocol)
- Identify the need for and establish urgent consultation with subspecialist (particularly if the condition has potentially life-threatening debut symptoms)

Laboratory skills

- Choose/order appropriate test(s) for a specific patient, taking into account:
 - o indications
 - o accuracy and limitations
 - o what is entailed for the patient in performing the test
- Interpret results for a specific patient

Competences related to regulations and principles

- Apply this regulation/principle relevantly and appropriately within my own clinical work

Level 3

I am confident I can:

Clinical skills (patient management and treatment)

- Decide and manage first line treatment
- Identify treatment failure and need for second-line management
- Identify when there is a need for, and deliver, genetic counselling
- Seek out and integrate new knowledge and concepts in relation to condition/treatment

Laboratory skills

- Create/issue an interpretative report of test results
- Select/justify tests according to their cost-effectiveness

Competences related to regulations and principles

- Explain regulation/principle in appropriate language to a non-specialist audience (patient or student/trainee)
- Seek out and integrate new knowledge and concepts in relation to regulation/principle
- Recognize and plan how to improve own limitations, and demonstrate improvement

1. Clinical hematology: Non-malignant hematology

1A: Red cell and iron disorders

The trainee has received training in:

	level 1	level 2	level 3
a Anemias due to deficiency (including iron, vitamin B12, folate)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Anemia of chronic disease (including functional iron deficiency)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Pure red cell aplasia	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Thalassemia	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Sickle cell disease	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f Other hemoglobinopathies	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
g Red blood cell membrane disorders	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
h Red blood cell enzyme disorders	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
i Other congenital anemias (congenital dyserythropoietic anemia, sideroblastic anemia)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
j Acquired immune hemolytic anemias	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
k Acquired non-immune hemolytic anemias	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
l Secondary Erythrocytosis	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
m Familial erythrocytosis	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
n Iron overload (primary hemochromatosis and secondary iron overload)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
o Porphyria and other rare metabolic disorders (e.g. methemoglobinemia)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
p Iron deficiency without anemia	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

1B: Bone marrow failure

The trainee has received training in:

level 1 level 2 level 3

a Acquired aplastic anemia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Paroxysmal nocturnal hemoglobinuria	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Fanconi's anemia	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
d Other inherited bone marrow failure syndromes (e.g. Blackfan-Diamond, telomeropathies)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

1C: Non-malignant white blood cell disorders

The trainee has received training in:

level 1 level 2 level 3

a Granulocyte dysfunction disorders	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Congenital neutropenia	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Acquired neutropenia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Lymphocytopenia and immune deficiency syndromes	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Secondary leukocytosis	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
f Eosinophilia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

1D: Quantitative platelet disorders and angiopathies

(see also section 6) - *The trainee has received training in:*

	level 1	level 2	level 3
a Immune thrombocytopenia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Thrombotic microangiopathies (e.g. thrombotic thrombocytopenic purpura)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Heparin-induced thrombocytopenia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Other drugs and vaccine-induced thrombocytopenia (see also section 6D)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
e Secondary thrombocytosis	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
f Disorders with telangiectasia (e.g. Rendu-Osler-Weber disease)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

1E: Consultative hematology

The trainee has received training in:

	level 1	level 2	level 3
a Hematological manifestations of non-hematological disorders	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Hematological manifestations of congenital metabolic disorders (e.g. Gaucher disease)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Hematological variations and abnormalities in pregnancy	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Neonatal hematological variations and abnormalities	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
e Hematological manifestations in infectious diseases	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
f Hyposplenism and hypersplenism	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
g Hemophagocytic lymphohistiocytosis (HLH)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

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2. Clinical hematology: Myeloid malignancies

2A: Myeloproliferative neoplasms

The trainee has received training in:

	level 1	level 2	level 3
a Chronic myeloid leukemia, BCR::ABL1-positive	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Polycythemia vera	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Essential thrombocythemia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Primary myelofibrosis (including early/prefibrotic myelofibrosis)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
e Systemic mastocytosis	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f Chronic eosinophilic leukemia, not otherwise specified	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
g Chronic neutrophilic leukemia	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
h Myeloproliferative neoplasm, unclassifiable	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
i Myeloid/lymphoid neoplasms with eosinophilia and tyrosine kinase gene fusions	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

2B: Myelodysplastic/myeloproliferative neoplasms

The trainee has received training in:

	level 1	level 2	level 3
a Chronic myelomonocytic leukemia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Other myelodysplastic/myeloproliferative neoplasms	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

2C: Myelodysplastic syndromes (MDS) and pre-malignant clonal cytopenias

The trainee has received training in:

	level 1	level 2	level 3
a MDS low risk	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b MDS high risk	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Knowledge of MDS with significant genetic aberrations (e.g. Germline predisposition, sf3b1, tp53, del[5q])	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Clonal cytopenia of undetermined significance	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

2D: Acute myeloid leukemia (AML)

The trainee has received training in:

	level 1	level 2	level 3
a Acute promyelocytic leukemia (APL)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Other acute myeloid leukemias with recurrent genetic aberrations	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c AML with myelodysplasia-related genetic mutations or cytogenetic abnormalities	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d AML secondary to clinical MDS, myeloproliferative neoplasms (MPN), previous chemotherapy or radiotherapy	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
e AML with germline predisposition	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f Acute leukemia of ambiguous lineage	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
g Blastic plasmacytoid dendritic cell neoplasm	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
h Myeloid sarcoma	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
i Other AML	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

2E: Pediatric myeloid disorders

The trainee has received training in:

level 1 level 2 level 3

a Myeloid proliferations associated with Down syndrome	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Juvenile myelomonocytic leukemia (JMML) and JMML-like neoplasms	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Noonan syndrome-associated myeloproliferative disorder	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
d Childhood MDS	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

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3. Clinical hematology: Lymphoid malignancies and plasma cell disorders

3A: B-cell neoplasms and other B-cell disorders

The trainee has received training in:

	level 1	level 2	level 3
a B-lymphoblastic leukemias/lymphomas (including Ph+ acute lymphoblastic leukemia [ALL] and other genetic abnormalities)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Aggressive B-cell lymphomas (including diffuse large B-cell lymphoma)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Burkitt lymphoma	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Mantle cell lymphoma	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
e Follicular lymphoma	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
f Lymphoplasmacytic lymphoma/Waldenström macroglobulinemia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
g Hairy cell leukemia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
h Marginal zone lymphomas	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
i Monoclonal B-cell lymphocytosis (MBL)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
j Chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

3B: T-cell lymphomas and Natural Killer (NK)-cell neoplasms

The trainee has received training in:

level 1 level 2 level 3

a	T lymphoblastic leukemia/lymphoma	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b	Mature T-cell lymphomas (e.g. peripheral T-cell lymphomas, anaplastic T-cell lymphomas, angioimmunoblastic lymphoma)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c	Rare T- and NK-cell lymphomas	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d	Large granular T-cell leukemia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

3C: Hodgkin lymphoma

The trainee has received training in:

level 1 level 2 level 3

a	Hodgkin lymphoma	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
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3D: Special entities

The trainee has received training in:

level 1 level 2 level 3

a	Immunodeficiency associated lymphoproliferative disorders (including post-transplant lymphoproliferative disorder (PTLD))	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b	HIV-associated lymphomas	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c	Cutaneous lymphomas (including mycosis fungoides and Sézary syndrome)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d	Primary CNS lymphoma	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e	Histiocytic and dendritic cell neoplasms	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f	Castleman disease	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

3E: Plasma cell neoplasms

The trainee has received training in:

	level 1	level 2	level 3
a Monoclonal gammopathy of undetermined significance (MGUS)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Solitary plasmacytoma	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Multiple myeloma	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Amyloid light-chain (AL) amyloidosis and monoclonal immunoglobulin deposition diseases	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Other plasma cell neoplasms (POEMS syndrome, plasma cell leukemia, monoclonal gammopathy of clinical significance, and others)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

3F: Pediatric lymphoid malignancies

The trainee has received training in:

	level 1	level 2	level 3
a Acute lymphoblastic leukemia (B or T)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Pediatric lymphoma	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

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4. Treatment of hematological disorders

4A: Principles of treatment

The trainee has received training in:

	level 1	level 2	level 3
a Chemotherapy	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Radiotherapy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c Immunotherapy	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Targeted therapy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Gene therapy	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
f Cellular therapy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
g Treatment of hematological disorders in pregnancy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
h Treatment of hematological disorders in frail patients	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
i Impact of treatment on normal physiology (growth, fertility, CNS)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
j Treatment of thrombosis and bleeding	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

4B: Stem cell transplantation and other cellular therapies

The trainee has received training in:

	level 1	level 2	level 3
a Indication for autologous stem cell transplantation	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Indication for allogeneic stem cell transplantation	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Mobilization, collection and manipulation of hematopoietic stem cells	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Criteria for selection of intensity for the preparative regimens	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Identification and selection of stem cell donor	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f Acute and chronic graft-versus-host disease	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
g Acute and late complications, including long-term follow up (pulmonary complications, veno-occlusive disease of the liver, hemorrhagic cystitis, and other complications)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
h Post-transplant monitoring	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
i Indications for CAR T-cell therapy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
j Indications for specific and other gene-modified cell therapy	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

4C: Prevention and treatment of infectious diseases

The trainee has received training in:

	level 1	level 2	level 3
a Neutropenic fever (including growth factors)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Bacterial infection	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Fungal disease	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Viral infection (reactivation and primary infection)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

4D: Supportive and emergency care

The trainee has received training in:

	level 1	level 2	level 3
a Cytopenias, nausea, and pain management	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Hyperleukocytosis, hyperviscosity, cytokine release syndrome and tumor lysis syndrome	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Rare complications (spinal cord compression and other neurological and psychiatric disturbances, superior vena cava syndrome)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Nutrition	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Medical palliative care (see also section 8F)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f Psychological care (see also section 8F)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

4E: Pharmacology and pharmacovigilance

The trainee has received training in:

	level 1	level 2	level 3
a Pharmacovigilance	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Adverse event management	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Drug interactions	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

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5. Laboratory diagnosis

5A: Good laboratory practice

The trainee has received training in:

	level 1	level 2	level 3
a Principles of laboratory management and organization	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
b Laboratory quality management and accreditation/certification (including internal and external quality control)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Hazards and safety	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Reference ranges of laboratory values, with relevance to gender, age and ethnicity	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Integrating diagnosis from laboratory investigations and relating them to the clinical picture	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

5B: Blood count and morphology

The trainee has received training in:

	level 1	level 2	level 3
a Automated full blood count with white blood cell differential, and recognition of pseudo thrombocytopenia	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b Performing aspiration and biopsy of bone marrow, and lumbar puncture	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Preparation, fixation, staining	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Evaluation and reporting of peripheral blood films, bone marrow aspirates, and trephine imprints	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
e Cytochemical, special stains of blood and bone marrow films in hematological conditions	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f Review and interpretation of trephine, lymph node and other relevant tissue biopsy specimens together with a pathologist	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

5C: Immunophenotyping by flow cytometry

The trainee has received training in:

	level 1	level 2	level 3
a Clinical applications of flow cytometry for diagnosis, classification, prognosis and evaluation of measurable residual disease and stem cell quantification	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Pre-analytical and analytical phase of flow cytometry of blood, bone marrow, and body fluids (e.g. specimen processing, surface vs. intracytoplasmic staining, acquiring data, gating strategies)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Essential surface and cytoplasmic markers, disease-oriented antibody panels applied in hematological conditions	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Data analysis	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
e Interpretation (e.g. determination of the lineage of cells of interest, clonality, stem cell quantification, telomere length and specific subtypes of hematological condition)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

5D: Genetics and molecular biology

The trainee has received training in:

	level 1	level 2	level 3
a Clinical applications of these techniques for diagnosis, classification, prognosis, and measurable residual disease evaluation of hematological disorders	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Conventional cytogenetic analysis, chromosome breakage and fluorescence in situ hybridization	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c Polymerase chain reactions for the detection of gene mutations, fusion genes, clonality assessment, and gene expression	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Other techniques for detection of copy number variations, gene polymorphisms, and recurrent mutations	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
e Interpretation of reports for detection and quantification of recurrent mutations (e.g., digital PCR)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f Other techniques for gene discovery and expression	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

5E: Coagulation

The trainee has received training in:

level 1 level 2 level 3

a Techniques for assessing coagulation and platelets	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b Assays for coagulation factors and inhibitors	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Assays for monitoring anticoagulants	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

5F: Immunohematology

The trainee has received training in:

level 1 level 2 level 3

a Pretransfusion tests (including red blood cell typing and allocation, and influence of antibody treatment) 2	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b Minor red cell, platelet and neutrophil antigens	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
c Laboratory diagnosis of newborn hemolytic disease	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
d Laboratory diagnosis of alloimmune and autoimmune cytopenias	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

5G: Other laboratory techniques

The trainee has received training in:

level 1 level 2 level 3

a Hemoglobin analyses (e.g. hemoglobin electrophoresis and high-performance liquid chromatography)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b Other red blood cell laboratory techniques (e.g. sickling test, oxygen affinity, red blood cell enzyme assays - pyruvate kinase, glucose-6-phosphate dehydrogenase)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c Laboratory work-up on iron metabolism and vitamin deficiencies	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Detection of immunoglobulin abnormalities	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

EHA grant funding.



https://eha.fyi/Grants_LtF

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6. Thrombosis and hemostasis

6A: General Aspects

The trainee has received training in:

level 1 level 2 level 3

- | | | | | |
|----------|--|-----------------------|----------------------------------|----------------------------------|
| a | Assessment and management of patients with a bleeding tendency (including those with bleeding disorder of unknown cause) | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| b | Management of acute bleeding (including adverse effects of pro-hemostatic drugs) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| c | Risk assessment, prevention, diagnosis, and treatment of venous thromboembolism | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |

6B: Acquired bleeding disorders

The trainee has received training in:

level 1 level 2 level 3

- | | | | | |
|----------|---|-----------------------|----------------------------------|----------------------------------|
| a | Massive bleeding in obstetrics, trauma and surgery | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| b | Disseminated intravascular coagulation (DIC) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| c | Coagulopathy associated with renal and liver disease | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| d | Drug-induced bleeding (including anticoagulants and antithrombotic therapy) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| e | Acquired bleeding disorders (e.g. acquired hemophilia, acquired von Willebrand disease) | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |

6C: Congenital bleeding disorders

The trainee has received training in:

	level 1	level 2	level 3
a Hemophilia A & B	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b Von Willebrand disease	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c Other (rare) congenital clotting factor disorders	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Considerations in carriers of hemophilia in relation to pregnancy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Congenital platelet disorders	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

6D: Thrombotic disorders

The trainee has received training in:

	level 1	level 2	level 3
a Anticoagulant and thrombolytic therapy in non-hematological medical conditions (including arterial thrombosis)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b Thrombophilia (congenital and acquired)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c Prevention and management of venous thromboembolism in pregnancy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Thrombosis in children, including purpura fulminans	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
e Prevention and management of venous thromboembolism in cancer	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
f Unusual site venous thromboembolism (e.g. splanchnic vein, cerebral vein)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
g Heparin-induced thrombocytopenia (and thrombosis) (see also section 1D)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
h Vaccine-induced thrombocytopenia (and thrombosis) (see also section 1D)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

EHA Guidelines at your fingertips.



https://eha.fyi/CPGApp_LtF

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diagnostic tools, and more.



7. Transfusion medicine

7A: Blood donation

The trainee has received training in:

level 1 level 2 level 3

- | | | |
|-----------------------|--|-----------------------|
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| a | Selection of blood and apheresis donors and deferral time between donations (for monitoring iron status) | |
| <hr/> | | |
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| b | Epidemiology and screening for blood borne infections | |
| <hr/> | | |
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| c | Blood collection procedures | |
| <hr/> | | |
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| d | Detection and management of adverse events related to blood donation | |

7B: Clinical use of blood components

The trainee has received training in:

level 1 level 2 level 3

- | | | |
|----------------------------------|---|----------------------------------|
| <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| a | Indication, choice and application of blood components. Items included: transfusion in elderly patients, autoimmune hemolytic anemia (AIHA), massive blood loss | |
| <hr/> | | |
| <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b | Use of blood products and alternatives in fetal, neonatal, and pediatric patients | |
| <hr/> | | |
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| c | Blood alternatives; management of patients who refuse blood transfusion | |
| <hr/> | | |
| <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| d | Transfusion reactions and complications, including hemovigilance | |
| <hr/> | | |
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| e | Patient blood management (multidisciplinary approach to optimize blood transfusion) | |
| <hr/> | | |
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| f | Management of platelet transfusion refractory patients | |

7C: Apheresis

The trainee has received training in:

level 1 level 2 level 3

- | | | |
|-----------------------|----------------------------------|-----------------------|
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| a | Indications and complications | |

EHA Clinical Guidelines.



https://eha.fyi/Guidelines_LtF

8. General skills

8A: Basic biological concepts

The trainee has received training in:

	level 1	level 2	level 3
a Hematopoiesis and stem cell biology	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b Chromosome and gene structure	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c The role of deoxyribonucleic acid (DNA), ribonucleic acid (RNA) and proteins in normal cellular processes	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Transcription and translation, epigenetic regulation, RNA splicing, signal transduction, cell cycle regulation and apoptosis, and methods of investigation	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f Mechanisms in hemostasis	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Epigenetic inheritance and pharmacogenomics in hemato-oncology	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
g Clonal hematopoiesis	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
h Immune biology	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

8B: Evidence-based medicine

The trainee has received training in:

	level 1	level 2	level 3
a Fundamental principles of evidence-based medicine	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
b Critical appraisal of scientific literature including statistical methods	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c Strategic and economic implications of combining drugs and clinical biomarkers	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

8C: Good medical practice and clinical trials

The trainee has received training in:

	level 1	level 2	level 3
a Multidisciplinary decision-making	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Clinical trial-related international and local guidelines and legislation (good clinical practice)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c Obtaining informed consent in clinical trials and in routine daily medical practice	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Methods for assessing patient reported outcomes including quality of life	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
e The impact of age on patient management (children, adolescents, and young adults) (geriatric/co-morbidity/frailty assessment) (see also section 4)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
f Indications for genetic counseling	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

8D: Ethics and law

The trainee has received training in:

	level 1	level 2	level 3
a Basic principles of medical ethics (including HELSINKI DECLARATION)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Functions of the Ethics Committee	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
c National regulations on how to manage a patient with reduced autonomy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
d Regulations concerning the use of human cells and tissues (bio-banking)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Basic principles of health economics and cost-effectiveness, including ethical implications of national health system	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
f European and national directives on patient rights	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
g Definition and disclosure of conflict of interest	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
h Regulations on off-label use of drugs	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

8E: Communication skills and psychosocial issues

The trainee has received training in:

	level 1	level 2	level 3
a Communication with patients (principles, methods, and techniques)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Communication with patients' relatives and cohabitants	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Communication within a multi-disciplinary team	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Psychosocial assessment	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
e Taking a history and physical examination directed at hematological diseases	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

8F: Palliative care and End-of-life treatment

(see also section 4D) - *The trainee has received training in:*

	level 1	level 2	level 3
a Palliative care decisions and management of patient communication at breakpoint decisions	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Management and decision-making related to end-of-life situations, including non-resuscitation and the requirement of patient information and participation in decision-making	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c National legal requirements regarding euthanasia	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Appendices

APPENDIX I.

EHA Curriculum Committee:

- Tomas Navarro Ferrando (Chair) Spain
- Marielle Wondergem (Vice-Chair) Netherlands
- Gunnar Birgegård Sweden
- Antonio Almeida Portugal
- Mahesh Prahladan United Kingdom
- Carlos Fernández de Larrea Spain
- Alicia Rovó Switzerland
- Janaki Brolin United Kingdom

APPENDIX II.

Curriculum Update Working Group:

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MHTT



Hungarian Society of Haematology and Transfusion

Norwegian Society of Haematology

Österreichische Gesellschaft für Hämatologie und Onkologie

Polish Society of Hematology and Transfusion Medicine



Belgian Hematology Society

British Society for Haematology

Société Française d'Hématologie

Bulgarian Society of Haematology



Danish Society of Haematology

German Society for Hematology and Medical Oncology

Dutch Hematology Association

Finnish Association of Haematology



Hellenic Society of Haematology

Israel Society of Hematology and Transfusion Medicine

Italian Society of Experimental Hematology

Haematology Association of Ireland



Lithuanian Hematology Society

Swedish Society of Hematology

Società Italiana di Ematologia

Slovak Hematology and Transfusiology Society



Slovenian Society of Hematology

Sociedad Española de Hematología y Hemoterapia

Swiss Society of Hematology

Sociedade Portuguesa de Hematologia



Turkish Society of Hematology

Macedonian Hematology Association

