

Entry Level Curriculum Update – [Immunology & Immunoematology](#)

The *Entry Level Curriculum* was created to provide guidance as to the knowledge and skills a new graduate at the MLT or MLS level should possess upon entry into the workforce. In this session, we will discuss changes to the **Immunology & Immunoematology** sections of these recently published documents and how best to utilize them in your curriculum.

Learning Objectives

1. Discuss the usefulness of the Entry Level Curriculum (ELC).
2. Explain changes that occurred in the recent update.
3. Identify and evaluate ways in which the ELC can be incorporated into your curriculum.

Development Process

The first Entry Level Curriculum (ELC) was published in 2002 and created by educators and practitioners using the Body of Knowledge (BOK) published by ASCLS. The ELC was revised during the 2015-16 year by a sub-committee of the Education Scientific Assembly (ESA), the Committee for Educational Programs and Initiatives (CEPI). The two main goals with the revision were:

- Use the recently updated (2014 version) ASCLS Body of Knowledge (BOK) and personal expertise in entry level practice to update the curriculum by removing dated topics and adding new items.
- Ensure differentiation of the MLT and MLS curriculum based on the level of education required for each.

There were 4 rounds of revisions in 2015-16:

- 1st revision reviewed at CLEC 2016 and from educators who could not attend
- 2nd revision reviewed by ASCLS members
- 3rd revision to BOD and 2016 House of Delegates
- 4th revision to ASCLS for publication

ELC committee members finalized all documents by applying the Beck/Moon algorithm introduced at CLEC 2016. The algorithm included three basic questions:

- Is it current practice?
- Is it entry level?
- Is it foundational?

In situations where conflicting comments were received, this algorithm provided the criteria for removing information from the documents.

Format

The curriculum format is delineated by discipline area within the MLS and MLT levels. Each discipline area is further delineated by major topics using a learning objective format which includes a sequence of concepts, principles/theories, and skills. Taxonomic levels (cognitive, psychomotor, affective) were included to assist new instructors and new programs.

It is understood that all listed technical items may not be available at each educational institution so that in some programs, only cognitive aspects (state, explain, describe) will be taught and at others the psychomotor may also be taught (perform or observe). The committee also expects that some

programs will teach beyond what may be included, based upon regional needs of their graduates and availability of resources.

What's New/What Changed?

Molecular diagnostics is a new addition to the 2016 version of the ELC. Other changes included **moving body fluids** from the Chemistry section to create a new Urinalysis and Body Fluids section.

Where there is overlap in some discipline areas, it is **cross-referenced** to another section within the ELC disciplines. For example, microscopic analysis in Hematology, Urinalysis & Body Fluids, and Microbiology are all cross-referenced to the more detailed microscope section in the General Practice document.

Differentiation in MLT vs MLS curriculum was based on the background knowledge (pre-requisite and/or core courses). Different cognitive levels were reflected in the verbs used to elucidate the tasks or knowledge. For example:

MLT version – Identify basic concepts of spectrophotometry

MLS version - Recognize and explain basic concepts of spectrophotometry

In many instances, the verb levels and expectations were the same, for example in performing tests or identifying abnormal results. A specific example is provided on page 3.

Finally, to assist educators in knowing which **items were deleted from the previous edition of the ELCs and which items were added, a summary list is included at the end of each discipline section.** This information could be useful when revising and updating course material. The addition/deletion lists for MLS Immunology and Immunoematology are listed on page 4 and for MLT Immunology and Immunoematology on pages 5-6 of this document.

Uses

The ELC is designed to

- help develop the curriculum for a new program
- assist the new instructor/professor with course development
- update a current program or course

In addition, the document can provide guidance to other organizations for entry level knowledge and skills of the MLS a or MLT graduate.

[See example of differences in verb levels between MLS and MLT levels on next page:](#)

<u>MLS Level – Immunology</u>	<u>MLT Level – Immunology</u>
Define Level 1 Innate immunity Adaptive immunity	Define Level 1 Innate immunity Adaptive immunity
Discuss & compare proposed mechanisms for autoimmunity Level 2 Sequestered antigen Molecular mimicry Escape of tolerance at T cell level	Describe proposed mechanisms of autoimmune disease Level 1
Correlate underlying defect, clinical symptoms, and laboratory findings for congenital/genetic B cell immunodeficiencies: Level 2 X-linked agammaglobulinemia Selected common variable immunoglobulin deficiencies	Discuss characteristics of congenital/genetic B cell immunodeficiencies: Level 1 X-linked agammaglobulinemia Selected common variable immunoglobulin deficiencies
<u>MLS Level – Immunohematology</u>	<u>MLT Level – Immunohematology</u>
Describe the immune process which causes hemolytic disease of the fetus and newborn (HDFN) Level 1	Describe the immune process which causes hemolytic disease of the fetus and newborn (HDFN) Level 1
Compare the principle & purpose of the direct antiglobulin test and the indirect antiglobulin test (antibody screen) Level 2	Discuss the principle of the direct antiglobulin test Level 1
Resolve discrepancies of ABO typing results Level 3 Perform and interpret tests using appropriate methods (e.g., lectins, saline replacement, and reverse grouping with A ₂ and O cells)	Identify discrepancies of ABO typing results and perform tests to resolve using appropriate methods (e.g., lectins, saline replacement, and reverse grouping with A ₂ and O cells) Level 2

MLS ELC Immunology & Immunoematology

Added and Deleted items

Additions Immunology

Autoimmune disease:

- Added additional diseases (e.g., celiac, autoimmune hepatitis)

- Additional antibody tests

- Role of HLA in autoimmune diseases

Tumor markers:

- listed key tumor marker tests

Deletions Immunology

None

Additions Immunoematology

Throughout the document updated test methods (e.g., include molecular, bacterial testing for platelets)

Deletions Immunoematology

Allogeneic Donation:

- Removed section dealing with donors

- Take donor history

- Perform physical examination

- Perform hemoglobin

- Obtain informed consent

- Perform phlebotomy use supplies for treating donor reactions

Autologous donation:

- Select donor

- Adapt history questions

- Collect blood

Sections such as developing and modifying procedures/guidelines (not-entry level)

HLA

- Changed "perform testing" to "observe testing"

MLT ELC Immunology and Immunoematology

Added and Deleted items

Additions Immunology

Infectious Diseases

Changed name from “Viral Infections” to be more inclusive of others such as bacterial

Added cross-reference to microbiology for this section

Added other infectious diseases – Strep, MMR, Syphilis, Rubella, CMV

Perform – modified to match “Immunological Techniques” section

Deletions Immunology

Humoral Immunity

Gene re-arrangement

Immunodeficiency Disorders

Chronic mucocutaneous candidiasis

Ataxia telangiectasia

Additions Immunoematology

Whole blood donation -- principles of donor selection

Modified to reflect level 1 knowledge, since actual collections are performed by blood donor facilities

Added Resolve questions

Blood collection

Updates – Modified to reflect level 1 knowledge, since actual collections are performed by blood donor facilities

Donor reactions

Updates – Modified to reflect level 1 knowledge, since actual collections are performed by blood donor facilities

Processing donor blood

Updates – Modified to reflect level 1 knowledge, since actual collections are performed by blood donor facilities

Added more currents tests

Autologous donors

Updates – Modified to reflect level 1 knowledge, since actual collections are performed by blood donor facilities

Preparation of cellular and plasma components from donor units

Updates – Modified to reflect level 1 knowledge, since actual collections are performed by blood donor facilities

Added Prepare (several)

Added QC

Blood group serology

Updates – Re-ordered sequence of subtopics

Changed Drop to Dispense

Added Perform and Interpret

Antiglobulin tests

Updates – added this section and reorganized appropriate test/concepts under it, etc

Special methods

Updates – added this section and reorganized appropriate test/concepts under it, etc

Pre-transfusion testing

Updates – Added Determine..., Analyze...

Hemolytic disease of the fetus and newborn

Updates – Added Perform testing...

Human leukocyte antigens (HLA)

Changed heading from Major to Human

Deletions Immunohematology

Whole blood donation -- principles of donor selection

higher levels such as, Select, Identify, Perform, etc.

Blood collection

higher levels such as, Select, Identify, Perform, etc.

Donor reactions

higher levels such as, Use

Processing donor blood

higher level of, Perform tests

Autologous donors

some higher levels such as, Select, Adapt, Collect

Preparation of cellular and plasma components from donor units

some higher levels such as, Prepare (some)

Hemolytic disease of the fetus and newborn

Predict risk.....