Entry Level Curriculum Update – Molecular Diagnostics

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 incorporation of molecular diagnostics section of these recently published documents and how best to utilize these 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) 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, including the section on molecular diagnostics.
- 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 dated 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.

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 and knowledge between MLS and MLT levels on next page:

MLS Level	MLT Level
Nucleic Acid Biochemistry Discuss/diagram RNA, DNA, and genome structure Level 1 Pairing of nitrogen bases Chargaff rules Pyrimidine, purine Complementary rule Sugars found in DNA and RNA Explain semi-conservative DNA replication Level 1 Origin or replication (eukaryote vs prokaryote) Leading strand Lagging strand Primase Okazaki fragments Describe DNA Level 1 Central dogma Transcription Polarity (5', 3') Nucleosides, Nucleotides Template strand Translation Codons/anticodons Ribosomes Genetic code Degeneration Wobble rule Extrachromosomal (plasmid, mitochondrial transmission) Compare and contrast viral, bacterial, eukaryotic Level 2 Complexity Shape Nucleic acid content	**Nucleic Acid Biochemistry** Explain semi-conservative DNA replication Level 1 Describe DNA Level 1 Central dogma Transcription Translation (codons/anticodons, ribosomes, genetic code/degeneration) Extrachromosomal (plasmid, mitochondrial transmission)