

Letter to the Editor

I am writing to respond to Dr McCoy's editorial in the Spring issue of *Clinical Laboratory Science* [*Clin Lab Sci* 2003;16(2):66] concerning an entry level Masters degree for clinical laboratory professionals.

Dr. McCoy used the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) standards for CLS/MT to make the case for a masters prepared entry level clinical laboratory scientist (CLS).¹ She cites the responsibilities of "... clinical decision-making, regulatory compliance, quality assurance/process improvement, evaluation of test systems, ... aspects of laboratory management, and adequate knowledge of research and design principles to evaluate published studies" as evidence that "entry-level knowledge has gone beyond the baccalaureate level."²

Intrigued, I decided to look at these responsibilities in detail and compare them with the entry-level competencies of other healthcare professionals. First I wrote down each responsibility listed in the editorial and looked at what was required for the task and then looked at the implied level of achievement (using Bloom's Taxonomy levels). Then I decided to see where similar levels of competence/achievement were found in entry-level competencies of other health professions. The responsibilities emphasized in the editorial are analyzed below:

- *Clinical decision-making.* The implication here is that information must be gathered, analyzed, some sort of algorithm or decision-tree used, and a decision made. The underlying responsibility is that the decision-maker must know what data to gather and what is and is not pertinent to the decision. This is an *application-level* task using Bloom's taxonomy.
- *Regulatory compliance.* In this case one must comply with predetermined criteria (established protocols). The task here is to keep up to date with criteria and follow the rules. This is also an application-level task.
- *Quality assurance/process improvement.* The competence required here is to follow standard quality assurance guidelines (established protocols) and be able to develop a process to improve quality or improve the system for quality assurance. This does involve logical thought processes to modify existing protocols (the synthesis level), but is this something only expected of a master's educated individual?

- *Evaluation of test systems.* This is written at the evaluation level but in general an algorithm or decision-tree process is used. (As a matter of fact, the NAACLS standards indicate algorithms will be used and that the CLS will "play a role in" development of such algorithms.) Once this type of process is used, it is possible to help write a decision-tree for a new set of test systems.¹ However, typically, an entry-level CLS/MT will be following a decision-tree process. This is actually very similar to clinical decision-making above, where the decision maker/evaluator must know what data is pertinent to the evaluation process and what is not. A good decision-tree or algorithm will help with the evaluation. The overall tasks are then frequently application tasks or synthesis tasks.
- *All aspects of laboratory management.* This is indeed a lofty expectation. However, the use of certain management tools, systems, and principles can be expected of an entry-level CLS/MT. "All aspects of laboratory management" are being learned every day by career laboratory managers—no one knows everything. The specific NAACLS responsibility actually states that the CLS will "possess basic knowledge, skills, and relevant experiences in" certain defined areas of management to "enable cost-effective, high-quality, value-added laboratory services."¹ The CLS will function at the application level in some instances and at the synthesis level in others.
- *Adequate knowledge of research design principles to evaluate published studies.* The end of this sentence in the NAACLS standards indicates that the CLS must "function as an informed consumer", not as a scientific journal editor.¹ Once again, a system of rules for evaluation is used to evaluate published studies. The rules here relate to "research design", but the concept of algorithm and decision tree still apply. Adequate knowledge does not require a graduate course in research design. And would one course in educational research design be adequate?

So, these six responsibilities come down to decision-making based on a set of criteria, compliance with protocols and guidelines, applying finance, marketing, and management principles to clinical laboratory management, and evaluating published studies as an informed consumer.

Let's look at our co-workers in the healthcare field to see what the expectations are for entry-level practitioners. I chose three professions that do not require a master's prepared entry level practitioner, but that do offer bachelor's and master's level course work in their field of study. It was easy to find the competencies from Web sites maintained by professional societies and educational organizations. The results of my investigations for respiratory therapists, dental hygienists, and registered nurses are enlightening.

Respiratory therapist

According to the American Association for Respiratory Care (AARC) Web site, respiratory therapists "perform intensive care, critical care, and neonatal procedures...[and] an increasing number of respiratory therapists are now working in skilled nursing facilities... and patients' homes."³ The typical duties of a respiratory therapist are then listed. A few are:

- diagnosis—interpreting data...
- treatment—monitoring and managing therapy, administering medications, conducting smoking cessation programs for patients...and in the community.³

You can see that these duties are at the application, analysis, synthesis, and evaluation levels.

If you know a respiratory therapist, you know that they routinely make and implement *independent decisions* about treatment and medication that are critical to keeping patients alive. Do you know what level of education is employed to more than adequately train respiratory therapists? The necessary skills and knowledge are taught in a *two-year degree in applied science* program. If you go to the AARC Web site you'll see a list of duties that includes education of the general public. The respiratory therapists have learned how to get the education and training done for these analytical, synthesis, and evaluation responsibilities in two years! Maybe we need to take a lesson from them.

Dental hygienist

According to the American Dental Education Association (ADEA) Web site, the competencies for entry into the profession of dental hygiene include among those in a four-page list (emphasis added):

- core: Use *evidence-based decision making* to evaluate and incorporate treatment modalities.
- community involvement: *Evaluate* reimbursement mechanisms and their impact on the patient's/client's access to oral healthcare.
- assessment: Select, obtain, and *interpret* diagnostic information..., perform a comprehensive examination using clinical,

radiographic, periodontal, dental charting, and other data collection procedures to assess the patient's/client's needs.

- diagnosis: Use *critical decision making* skills to reach conclusions about the patient's/client's needs based on all available assessment data.
- planning: *Establish a planned sequence of care* (educational, clinical, and evaluation) based on dental hygiene diagnosis, identified oral conditions, potential problems, etiologic and risk factors, and available treatment modalities.⁴

When you visit your dental hygienist I'm sure you've found that he/she is conversant in immunology, scientific data gathering, and clinical decision-making. Do you know what level of education is employed? You may have guessed: a *two-year degree* in an applied science program is what is needed to become a dental hygienist. In some states, dental hygienists can open an independent practice and in others they can administer anesthetics. How do they learn all that medicine, decision-making, and office management in two years? Perhaps clinical laboratory educators should investigate how it is done.

Registered nurse

For information on the competencies, skills, and knowledge required for the various levels of nursing care practitioner, I went to a document prepared by the Illinois Articulation Initiative (IAI) that includes competencies in nursing for a range of providers from certified nurse assistants to bachelor's prepared nurses. Because of the levels of competencies I found for associate degree prepared respiratory therapists and dental hygienists, I only investigated the associate degree/diploma entry level nursing competencies (note, the IAI indicates that these competencies are not repeated at the BSN level, they are added to). These competencies include (emphasis added):

- conceptual function: Utilizes principles of *leadership, problem solving, decision-making, and conflict resolution* in the management of care; *applies teaching/learning principles* to adapt standardized teaching plans to meet individual learner needs.
- technical/professional: *Establishes data base* for client based on ... *assessment*; establish priorities for organizing nursing care among individual clients; carries out established research protocols;...*delegates* to peers and assistive personnel; seeks assistance from peers and other members of the healthcare team in situations that require level of knowledge.
- interpersonal communication: Provides direction for other members of the healthcare team; *participates in determining the feasibility of research plans*.
- integrative: *Analyzes data* from client, family, and other healthcare resources and *selects appropriate nursing diagnosis*; *uses research findings in problem solving and decision*

making; participates in integration of research results in the modification of practice standards, policies, and procedures.

- adaptive: Modifies teaching/learning plan based on evaluation of learner response.
- member discipline: *assesses own abilities and potential*, sets goals and demonstrates on-going personal and professional development.⁵

Based on this quick investigation into some of our peers in healthcare, I propose that we in CLS education need to take a fresh look at how and what we teach at various levels of education. It seems that the claims for the need for a master's prepared entry-level laboratory professional are out of sync with our peers (never mind the pay issues and the years of training frequently mentioned). We seem to be out of touch with what other healthcare students and professionals are expected to do. Our students have the same basic science courses they do—in many cases, our students have more basic science—yet we say that our bachelor's level students cannot “acquire adequate knowledge of research design to evaluate published studies.” This is expected of the associate degree nurse (ADN) and the associate degree dental hygienist. We just need to teach our students to do this. Perhaps the real problem is a fear of this unknown material for some bachelor's level educators. Then our professional organization needs to offer workshops in that subject rather than waste time lobbying for a master's level “lab tech”. Our students just need to be taught the principles of research design as they apply to laboratory medicine and evaluation of methods.

It is obvious that clinical decision making, analysis, synthesis, and evaluation skills can be covered in a two-year health career education program. Our peers in healthcare education do it now. Why do CLS educators feel they cannot cover this material in a baccalaureate program? It seems from looking at our peers that the material could be covered in two-year program.

Look at the last competency I noted for ADNs above. It is the competency to assess [one's] own abilities and potential, set goals, and demonstrate on-going personal and professional development.⁵ I would suggest that clinical laboratory medicine educators do just that: assess what our abilities and potentials are and set realistic goals. I propose a task force on clinical laboratory education whose charge is to begin with no pre-conceived notions of what can or cannot be taught in two, four, or six year college programs. This task force should investigate how other healthcare professionals are taught the skills and competencies necessary to function autonomously. Such a task force might indeed recommend that the CLS/MT responsibilities can be

taught in a two-year program. I know this smacks of heresy, but we need to open our minds to self-assessment of our profession.

I have been a CLS educator for more than 20 years. In that time I have taught in integrated BS level programs, a hospital based program, the college-based portions of a 3+1 program and a CLT/MLT program (along the way I taught some engineering students biotechnology, as well). I have found that MLT students, on the whole, are more mature and career-oriented than undergraduates in four-year schools. This is not surprising; the average age of community/technical college students is 29. Also, I have found that they can learn the material covered in the responsibilities noted for CLS/MTs above. They can, and do, routinely apply criteria to evaluate information and make informed decisions.

In sum, my analysis of a few of the responsibilities required of CLS/MTs and the entry-level competencies of only three other healthcare professions leads me to make a modest proposal (to borrow a phrase). I propose that CLS educators and CLS professionals and employers endorse a task force to thoroughly evaluate how to educate laboratory professionals with the charge that the final goal is enough competent entry-level professionals to fill the anticipated vacancies in our profession. I sincerely hope I have sparked the curiosity and evaluative traits (found in laboratory professionals) in enough people in our field to continue my brief investigation.

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