

The Case for the Clinical Doctorate in Laboratory Science

KATHY DOIG

ABBREVIATIONS: BS = bachelor of science; CLS = clinical laboratory scientist; CLT = clinical laboratory technician; DLS = clinical doctorate in laboratory science; DO = osteopathic doctorate; EdD = doctorate in education; MD = medical doctorate; MS = master's degree; OT = occupational therapy; PharmD = Doctor of Pharmacy; PT = physical therapy.

INDEX TERMS: clinical doctorate; doctorate in clinical laboratory science.

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Address for correspondence: Kathy Doig PhD CLS(NCA) CLSp(H), Medical Technology Program, Michigan State University, 322 N Kedzie Hall, E Lansing MI 48824. (517) 353-7800 x 8, (517) 432-2006 (fax). doig@msu.edu

One proposal to advance the clinical laboratory science (CLS) profession has been to mandate a master's degree (MS) as entry qualification for positions that currently require a bachelor's degree. Proponents have presented the following arguments:

- other health professions that command higher salaries have made the move to advanced degrees for job entry, e.g., physical therapy (PT) and occupational therapy (OT); thus, proponents argue, the advanced degree could be expected to achieve the same for laboratory professionals.
- there are tasks within the laboratory that demand additional education beyond what is incorporated into current bachelor's degree programs.
- bachelor of science (BS) curricula are so packed as is, that addition of new content will require time beyond the BS, thus an MS.

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- nearly 35% of the students in BS programs and especially hospital-based programs already possess a BS degree.¹ They would prefer to be earning an MS and this may make the profession more attractive to other such students.¹

Opponents of the idea of mandating an MS at entry have presented the following arguments:

- the added time and expense will discourage many students from selecting laboratory careers at all.¹
- some programs will close because they will be unable to provide MS-level education.¹
- fewer students will enter these programs and the shortage of personnel will be exacerbated because there is no reason to believe that managers will pay MS graduates more than they pay BS graduates OR that they will use them differently.¹
- there is no independent practice (as in physical therapy and occupational therapy) so salaries will not rise to compensate for the added time and expense involved in the master's degree education.
- managers value experience over academic credentials and the MS graduate is unlikely to be hired directly into a management level position.¹
- students who select CLS as a career rarely do so due to an interest in management, rather it is the science that interests them; so an entry level job that is heavily weighted to management may discourage many students. Though this might argue for them to take the clinical laboratory technician (CLT) route, they may also quickly become bored with routine work and leave the laboratory profession anyway.
- most current managers do not hold advanced degrees and having been successful without one, they may not see the value for an entry-level master's degree.^{1,2}

Proponents have not garnered the support to move the proposal forward and gain the endorsement of the professional organization.³ Yet there seems to be support for a next phase in the advancement of the clinical laboratory profession and perhaps correction of some weaknesses in the current career model.⁴

DIALOGUE AND DISCUSSION

CURRENT CAREER PATHS

Figure 1 depicts the current career paths in the clinical laboratory and demonstrates the following. First, the entry-level job of a CLT has a high degree of overlap with that of a CLS and in some facilities is virtually the same.⁵ This similarity is demonstrated in job advertisements that ask for either CLS or CLT credentials for the same position. This overlap and similarity discourage both CLTs and CLSs; the former feeling that they are underpaid for the work they do while the latter feel under utilized. The dissatisfaction of CLSs then leads to high attrition within the first five years on the job as they seek careers where they can use their clinical knowledge and have more responsibility, e.g., medicine, physician assistant, dentist, etc.²

Also shown in Figure 1 is that the road to management is relatively distant for the BS-CLS despite substantial management education in the BS curricu-

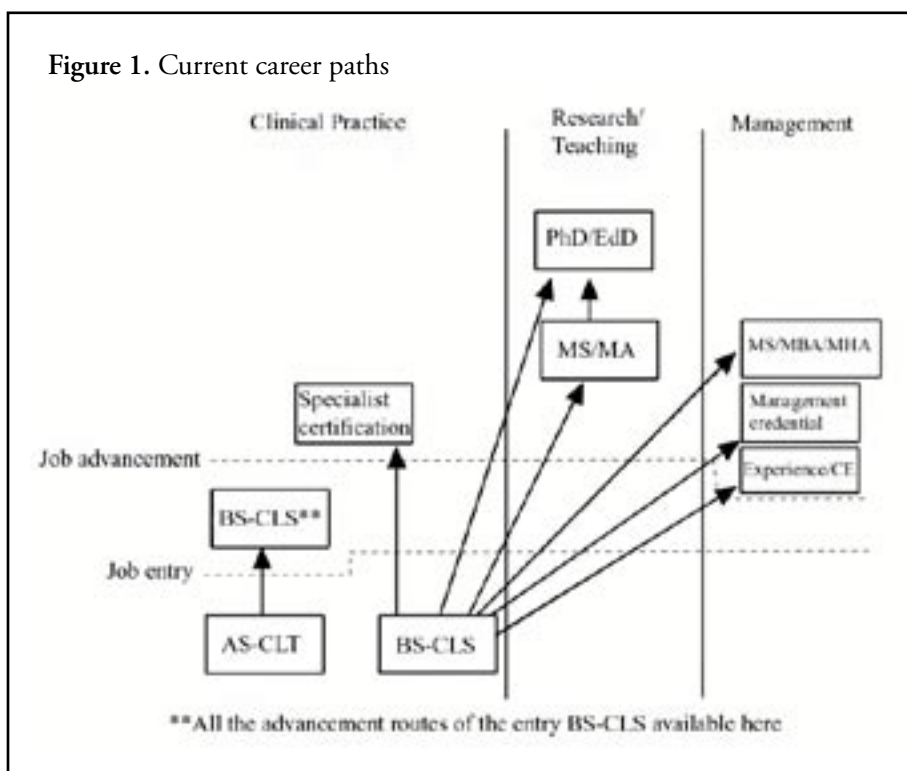
lum for the last 20 years. So once again, BS graduates are not permitted to use their education, thus contributing to their dissatisfaction.⁵ Many laboratory managers earned their credential before management became a standard part of the CLS curriculum, and thus may not know what current curricula include and how they could capitalize on the skills of new CLSs.²

The diagram depicts substantial routes to advancement in management and in research/education. These career paths seem to be well developed as is and there is little discussion at professional meetings about changes to these paths. But the most obvious feature of Figure 1 is the dead-end for individuals with an interest in advancing their clinical scientific knowledge and practice. Although they can take the path of graduate education in one of the sciences, they may be lost from the clinical laboratory as they then pursue advanced careers in research laborato-

ries, or in the in vitro diagnostics or pharmaceutical industries. They will introduce themselves saying "I used to be a CLS", if they acknowledge it at all. The lack of opportunities for advancement in clinical practice contributes to the loss from the laboratory of many of the best and brightest who want more challenge, though not in management or research. They must look outside laboratory medicine for the opportunity to use what they know about laboratory testing and pathophysiology in a patient care context.

THE CALL TO CONSULTANCY

The option to act as a consultant and thus correct this deficiency in career paths has been simmering in various ways for many years. Diana Mass has advocated for a consultative role for baccalaureate laboratory professionals for more than a decade.⁶ Her conception surely included care providers as the audience for the consultant's advice, but she has also spoken about consultancy more broadly as in management consulting to physician office laboratories and others. More recently, Doig proposed the notion of a consultative role comparable to the Doctor of Pharmacy (PharmD) degree that prepares graduates specifically as consultants to care providers, though she too did not envision that a doctoral degree would be the qualification for this role.⁷ The concept of a clinical consultant met with enthusiasm at the 2003 Clinical Laboratory Educator's Conference in New Orleans.⁴ At the same conference, Fowler presented a curriculum outline for such an individual.⁸ The idea took greater form in a report of the American Society for Clinical Laboratory Science (ASCLS) Futures Task Force, that specifically identified a clinical doctorate as a future role for CLSs.⁹ An ASCLS position paper is in preparation. Montoya shared the



concept from the ASCLS task force, including a modification of Fowler's curriculum, with a broader audience at the 2004 Futures Conference of the National Accrediting Agency for Clinical Laboratory Sciences.¹⁰ So what is the picture that is emerging for this advanced practice consultant?

A DOCTORATE IN LABORATORY SCIENCE

In brief, the current conception is a clinical (or professional) doctorate that would prepare individuals in advanced laboratory practice as consultants to care providers on the selection and interpretation of laboratory tests. Imagine a person who knows what a specialist knows in all laboratory areas and demonstrates a set of skills in consultation and patient education. This individual may provide direct patient education on the interpretation of the laboratory tests, as with direct access testing. He or she may also provide patient education like instructing dia-

betics or coumadin patients on the use of their home testing instruments.

The clinical doctorate differs from a doctor of philosophy (PhD) in that the focus is practice, not research. The PharmD is one such clinical doctorate, but so are medical doctorates (MD) and osteopathic doctorates (DO). The distinction is similar to the difference between a PhD in education, which focuses on educational research, and a doctorate in education (EdD) that focuses on advanced knowledge about teaching and application of that knowledge, with only a limited orientation to research.

THE EMERGING CAREER PATHS

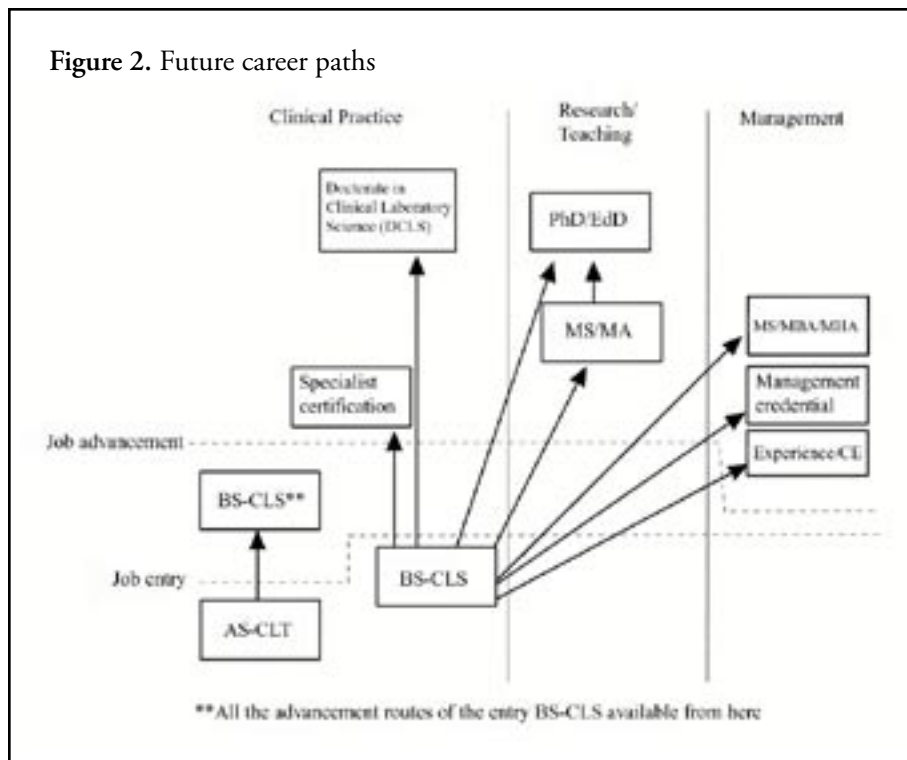
The appeal of this idea is evident when comparing Figure 1 with Figure 2 that depicts an alternate view of career paths that could address problems identified in the clinical laboratory professions. The first item to note is that a more clear distinction is to be made at ca-

reer entry for AS and BS individuals. In particular, laboratory managers should capitalize on the background in management, education, and pathophysiology that distinguishes the education of CLSs from CLTs. In so doing, the jump to management from the BS is smaller. One way to do this is to think about this question: "If the CLTs in your institution brought a law suit claiming that they deserved equal pay for equal work, how would you differentiate the work of the CLSs to justify their higher salary?" There are laboratory managers who have effectively required all CLS staff to engage in either management or educational functions that justify the distinction in pay. But notably, this model does not advocate for a master's degree at entry to assume these functions. Rather just good use of the knowledge possessed by current BS graduates which then is amplified and augmented by experience and continuing education.¹¹

The more dramatic difference between Figure 1 and Figure 2 is the addition of an advancement opportunity in clinical practice by the creation of a clinical doctorate in laboratory science – DLS. This individual would assume the role described above of a consultant to physicians and other care providers. The DLS would be part of an in-hospital attending physicians and physicians in training. The DLS would be an extension of the laboratory staff with the explicit role of helping to insure proper laboratory utilization. The expected benefits would be improvements in both the preanalytical and postanalytical aspects of testing. These have the potential to reduce costs by improved utilization of services. Improved diagnostic efficiency that leads to more appropriate treatments and reduced lengths of stay when useful data is generated more quickly,

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Figure 2. Future career paths



can be expected. In short, the DLS would be a contributor to better patient care overall. DLSs will conduct practice-based research on laboratory services utilization and impact on patient outcomes and costs to substantiate the value of a DLS in patient care.

THE CHALLENGES TO IMPLEMENTATION

There are forces that will resist such advancement for the clinical laboratory professions, producing challenges to be overcome:

- doctoral-level laboratory scientists, especially clinical chemists, already believe they should provide this service.^{12,13} Yet their research oriented education and limited scope of laboratory expertise fail to prepare them for the clinician role. They recognize that a generalist background is needed as a foundation for effective consultation. Examine the conference topics for their annual meetings and it is evident that they are learning via continuing education what certified CLTs and CLSs learn in their undergraduate academic programs.
- pathologists may resist this advancement as they provide this kind of consultation, but typically only at the request of the physician. The ready availability of a DLS who does not have other responsibilities for laboratory service, on the inpatient areas and in the clinics could be seen as competition for pathologists. Yet some pathologists may see this as a valuable extension of the laboratory's services. They will need to be recruited to convince their colleagues of the DSL's value.
- the patient care role must be recognized by third-party payers for reimbursement for the services.
- educational programs must be developed and will experience a period of time in which faculty will not be qualified themselves as DLSs. Rather a cadre of

experts with knowledge in various areas will need to be collected to train the first true DLSs. Over time, DLSs will assume educational roles in academic programs at which time the profession will have truly matured.

- states will need to license and recognize the patient care, e.g., clinician role, of these individuals.
- funding for a demonstration project to document the value of this role in the healthcare team will need to be found. We should not wait for a curriculum to be developed and for the pioneering students to complete it. Rather a group of certified, experienced, seasoned professionals should be recruited to a fast track program that would quickly demonstrate the value of such personnel even without validation of a DLS degree. The development of the PharmD demonstration project provides a model to follow.¹⁴ This is needed to convince prospective employers that they need these individuals. They will create the demand that then will convince educational institutions to invest in developing the programs to educate DSLs (Figure 3).
- universities should collaborate on the development of the educational programs. Doig recommended various collaborative models that would maximize the use of scarce resources (faculty time, faculty expertise, etc.).¹⁵ The advent of the Internet and the expansions of distance delivery that it provides make this even easier and more economical to achieve.

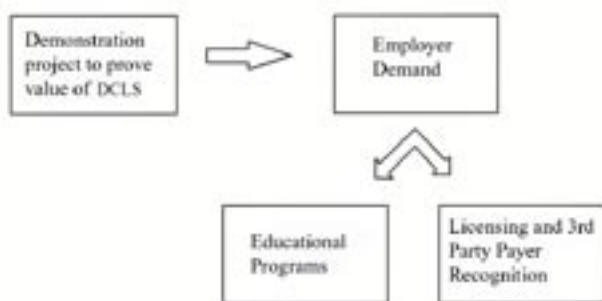
These barriers are not reasons to avoid this challenge. They are merely things that must be considered and addressed in the planning and development.

A DREAM COME TRUE

The development of the DLS will truly be the culmination of the intent of the 1988 and 1989 ASCLS position papers that set the year 2000 for establishing the doctorate as the terminal degree in CLS.^{16,17} In 1990, only two institutions nationwide offered a doctorate in any form.¹⁸ One was an interdisciplinary PhD program that permitted an emphasis in laboratory science. The other was a Doctor of Arts, to prepare teaching faculty. Three other institutions had plans to develop doctoral programs and none of those has come to fruition more than a decade later. Northeastern University in Boston and Catholic University in Washington DC remain the only two doctoral programs at present, though as before, others have plans to develop such programs.

Although lack of resources was apparently not a contributor to the failure to develop new programs, perhaps one factor was

Figure 3. Sequence of events in development of the DLS as a career option



that the orientation of the curriculum and the perceived role of the graduates were not clearly articulated and distinct.¹⁸ The idea of clinimetrics, the science of laboratory analysis, proposed by James Westgard and endorsed by ASCLS, never took hold, in part because it was not sufficiently distinct from existing programs in clinical chemistry that began to decline in enrollments during the 1990s.¹⁹ It was difficult for planners to describe how the new doctoral programs would be truly distinctive—reflecting at the doctoral level, the unique combination of basic and applied sciences that composes the practice of CLS. Those few institutions that were looking toward a doctorate in 1990 were anticipating PhD programs. None of them was considering a clinical doctorate that will be able to provide that special blend.

CONCLUSION

While the prospects of an entry-level master's degree in CLS have failed to galvanize a strong following and plans for PhD programs have foundered, the clinical doctorate readily attracts proponents. Perhaps it is because so many practicing laboratorians and educators would aspire to such degrees and positions themselves. I know I would.

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