The Doctorate in Clinical Laboratory Science: A View of the Process of Integration into Healthcare

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ABBREVIATIONS: DCLS = doctorate in clinical laboratory science; PDRF = Professional Doctorate Task Force.

INDEX TERMS: advanced practice; clinical doctorate; clinical laboratory science; professional doctorate.

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Many evolutionary environmental elements are converging to create the window of opportunity that is the doctorate in clinical laboratory science (DCLS). A possible grouping of elements defining our present healthcare environment vis-à-vis the DCLS can be comprised of (1) rapid technological expansion within the clinical laboratory,[1] (2) the current complex regulatory and financial environment for healthcare delivery,[1] and (3) emergence of an "advanced practice" or "advanced degree" construct in many professions.[2,3] The presence of these environmental elements impacts not only the implementation of DCLS programs but the practitioner as well.

THE DCLS AND RAPID TECHNOLOGICAL ADVANCES

With rapid technological advances, the impact of laboratory information happens in "real time". There is a vastly decreased "information gap" between the medical order and receipt of actionable information. Sophistication in technology coupled with standardization of data transfer protocols and databasing/data-mining capabilities has created a global market for our services and information as well as the possibility of off-site service delivery.

One unique aspect of DCLS practice is defined by the development and utilization of evidence-based practice. On a patient by patient basis, the DCLS will be involved in the development and interpretation of practice guidelines and the collection and utilization of outcomes data. On a daily basis, the DCLS will establish relationships with other healthcare providers and redefine existing relationships of these providers with CLS and clinical pathology.

In today's educational market, most programs are Internet-based to some extent, thus capitalizing on robust course management software and delivery systems commonly available. With the obligation to provide wide access to the DCLS in healthcare delivery, the Professional Doctorate Task Force (PDTF) has developed a model curriculum that lends itself to distance delivery. Further, the PDTF is exploring interest in consortia development that would allow multiple institutions to share some or all of their collective resources in program delivery. These efforts will favor "market penetration" of our keystone practitioner as many students are allowed the opportunity to train - and then remain - in their local communities. From a program quality and outcomes perspective, participation in consortia and distance delivery affords an opportunity to, at a national level, collectively interpret program accreditation standards and participate in continuous quality improvement. Therefore, a foundational concept in DCLS program design and implementation, i.e., distance delivery, emanates from this technological environment.

THE DCLS AND THE REGULATORY AND FINANCIAL CONTEXT OF HEALTHCARE DELIVERY

Today's complex regulatory and financial healthcare delivery environment has developed in tandem with technological advances. Rules govern payment for services based on patient status, technology employed, laboratory licensure, and accreditation status, however there are no systemic guidelines

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or criteria for cost-efficient or medically appropriate test utilization across all provider settings.

Our keystone practitioner will be perfectly positioned to suggest algorithmic approaches to the evaluation of laboratory information utilization. Having DCLS placed in all provider settings will favor the development of industry-wide utilization guidelines which will, in turn, decrease errors, decrease costs, and increase good patient outcomes in all service venues.

From the programmatic perspective, a cooperative, national (distance or "blended" delivery) approach to DCLS practitioner education will assure access to common educational content related to the current complex regulatory and financial environment of healthcare delivery. Regardless of the limitations of the local training environment, DCLS students could develop competency in areas considered pivotal in evidence-based practice including regional and national assessment of health risk. Not only does this educational approach speak to the development of a national workforce, but it also favors the emergence of common DCLS job responsibilities later in practice, thus hastening the availability of job analysis-based DCLS certification.

THE DCLS AND THE "ADVANCED PRACTICE" CONSTRUCT

One extension of the emergence of advanced practice levels within other healthcare professions is that there will be an increased need for our services, e.g., the provision and utilization of laboratory information. With this increased demand for laboratory services comes an increased demand for consultative services relative to appropriate ordering and results interpretation. The demand for patient consultation will also increase as utilization of laboratory services increases among healthcare providers.

Ultimately as the DCLS practitioner is fully integrated into healthcare delivery, DCLS practice will be focused by demand for these patient and provider consultative services. The DCLS will coordinate the integration of laboratory services as needed into the practices of other healthcare professionals and for the management of patients directly. Since utilization of laboratory information is foundational to the practice of all other healthcare providers, DCLS practice affords an unprecedented opportunity to coordinate laboratory information among all providers to better organize patient care and case management efforts for the entire interdisciplinary healthcare delivery team. In daily practice, the DCLS, our "advanced practitioner," will fill an integrative role among other advanced healthcare practitioners thus contributing to a true interdisciplinary approach to patient care. In addition, the role of the DCLS will impact the roles of the CLS (baccalaureate degree clinical laboratory scientist) and CLT (associate degree clinical laboratory technician) as application of evidence (downstream effects of laboratory information) suggests more efficient use of skills at each practitioner level.

In 2002, the Institute of Medicine convened a summit, which included 150 participants across disciplines and occupations, to discuss next steps for reform of healthcare education.[4] The follow-up report, "Health Professions Education: A Bridge to Quality", identified a core set of competencies (patient-centered care, interdisciplinary teams, evidence-based practice, quality improvement, and informatics) that should be incorporated into all health professions education. All these competencies are represented in the core competencies of the DCLS. A national, collaborative approach to DCLS program delivery will provide an opportunity to benchmark best practices related to these competencies and assure students' exposure to interpretation of competency in multiple practice settings.

IMMEDIATE NEXT STEPS IN THE DCLS IMPLEMENTATION PROCESS

Efforts are being focused on development of the DCLS "practice vision" as described above and development of DCLS educational programs to prepare and translate that practice vision. A summary of initiatives underway currently to either define DCLS practice or identify and develop resources needed for DCLS program implementation follows.

From the practice perspective, the PDTF has called for reports of practice, in the workplace today, that represent competencies defined for the DCLS. Follow-up interviews with practitioners submitting reports have been scheduled to detail the relationship of these "practice vignettes" to DCLS competencies. Qualitative data obtained from these interviews will be plumbed for themes, compared among reports, and combined to produce collective DCLS practice descriptions. The results of this study will be published in *Clinical Laboratory Science* and will help define the role of the DCLS for our many consumers and practitioners alike. In addition, results of the study will be presented at the ASCLS 2007 Annual Meeting in San Diego, CA.

Also from the practice perspective, the PDTF has initiated a review of the literature to unearth reported (non-

anecdotal) studies defining laboratory based evidence for practice. This important literature review will also be published in *Clinical Laboratory Science* and contribute significantly to the development of guidelines for outcomes and translational research studies appropriate for DCLS design, implementation, and evaluation.

The PDTF intends to highlight aspects of consumer questions from the ASCLS website. Believing these questions to indicate consultative services desired by our patients, analyzing these question categories will inform DCLS practice in local practice environments as well.

Lastly from a practice perspective, leadership of ASCLS and NAACLS (National Accrediting Agency for Clinical Laboratory Sciences) have developed a joint education statement bulleting the gaps in healthcare delivery that will be filled by the DCLS. The education statement is intended to inform all healthcare professions as well as the general public about the efforts undertaken by our profession to advance quality healthcare delivery through the development of the DCLS. Prior to its release to the general public, the education statement will be circulated to the national organizations of many healthcare professions and offices of national consumer advocacy groups to ask for their support of this new practitioner. The education statement will be released with the list of supporting organizations prior to the ASCLS 2007 Annual Meeting.

The PDTF hosted a productive and well-received "Professional Doctorate Implementation Forum" in February during the ASCLS Clinical Laboratory Educators' Conference (CLEC) 2007 in Louisville, KY. The primary purpose of the forum was to attract and inform representatives from institutions with serious interest in program implementation. During the forum, the DCLS curriculum was discussed and preparation was made for the collection of information regarding resources available for program implementation. Each institution represented at the forum will be asked to complete a detailed "Program Resources Questionnaire" that will provide data necessary for program proposal and/or consortia development. Fifteen institutions, representing five of the six regional accrediting agencies in higher education, expressed interest in program implementation.

During the ASCLS 2007 Annual Meeting, the PDTF will host an invitation only meeting for those institutions returning a completed "Program Resources Questionnaire." During the planning session, efforts will focus on the preparation of individualized program proposals for specific institutions. In addition, institutional missions will be explored for connections to the aims of grantors known to support innovative educational program development. Consortia development may be addressed from the perspective of accreditation, resources, and logistics.

The model curriculum developed by the PDTF is currently being reviewed by both external (outside the profession) as well as internal reviewers. A "Curriculum Evaluation Guide" was designed to capture reviewers' comments and feedback thus provided will be analyzed and considered as the basis of curriculum modifications. This iterative process will be documented and used not only to build meaningful curriculum but to speak to the need for the DCLS.

The professional doctorate in clinical laboratory science continues to evolve from concept to reality. In fact the process seems to be accelerating with these various aspects of development converging to set the stage for program implementation at an optimum time of public awareness. Continue to monitor our professional literature and the ASCLS website (www.ascls.org) for progress updates and ways to become involved in the implementation process.

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