DCLS Proposal-Concept Document Sample

The following DCLS Proposal-Concept Document is a sample to serve as a guide. Each institution and state has specific criteria for new program proposal and approval.

Acknowledgement:
Rutgers, School of Health Related Professions
Department of Clinical Laboratory Sciences
(formerly the University of Medicine of Medicine & Dentistry of New Jersey transitioned to Rutgers, The State University on July 1, 2013)

CONCEPT DOCUMENT
DOCTORATE IN CLINICAL LABORATORY SCIENCE

Name of Institution
University of Medicine & Dentistry of New Jersey (UMDNJ)
School of Health Related Professions (SHRP)
Department of Clinical Laboratory Sciences (CLS)

Name of New Program
Doctorate in Clinical Laboratory Science

Proposed Degree Designation
Doctorate of Clinical Laboratory Science (DCLS)

Type of Program
The DCLS is an advanced practice doctoral program requiring an entry level baccalaureate degree and national certification as a Medical Laboratory Scientist, MLS (ASCP)^{CM} as a prerequisite.

Campus
The administrative office of the program will be housed on the UMDNJ-SHRP Newark campus, Department of Clinical Laboratory Sciences. The didactic portion of the program is a distance, online degree program and is available to students across the state and nationally. Clinical practice will take place at local, regional, and national affiliated health care institutions.

Pedagogy and Mode of Delivery
The pedagogy for the DCLS is innovative, employing a mixed pedagogical approach of objectivist and constructivist learning strategies, with emphasis on the constructivist approach and problem based learning. The design meets the needs of the global profile of the working adult learner. It blends distance education and clinical experience.

Anticipated Start Date: September 2012

Licensure/Certification Requirement
At this time, no additional certification will be required to gain employment. The Board of Certification of the American Society for Clinical Pathology (ASCP-BOC) is committed to the development of a DCLS Certification Exam. However, the test development requires a job analysis. This cannot occur until a cadre of DCLS professionals are in positions, which will then provide the opportunity for a job analysis.

Collaboration with Other Institutions - Course and Faculty Resource Sharing
A collaboration agreement for course and faculty resource sharing has been explored with three institutions: University of Massachusetts – Dartmouth, Michigan State University, and University of Minnesota. This collaboration will provide an enhanced education experience with opportunities to share expert faculty and collaborative participation in curriculum development and course design. Each university will grant their own DCLS degree to students accepted into their program. Each institution will contribute to the development and assessment of the curriculum. Students may select pre-approved elective courses from the partner institutions. Specific courses at partner

institutions will be approved as part of the curriculum, and will not be considered as transfer credits. The credits for clinical practice courses will be offered by each university at their own affiliated health care institutions.

Accreditation
The program is designed for Medical Laboratory Scientists certified to practice in the United States. The National Accreditation Agency for Clinical Laboratory Sciences (NAACLS) has established accreditation criteria for the DCLS program. This accreditation will be sought once the program has been approved.

PROPOSED PROGRAM: MISSION, OBJECTIVES & COMPETENCIES

Mission

The mission of the proposed DCLS is to prepare graduates for advanced practice in clinical laboratory science. This program will instill the importance of the inter-professional team approach to health care. The DCLS is designed for the certified Medical Laboratory Scientist with an interest in advancing theoretical and clinical learning, practice, and research.

Program Goals

The program enhances knowledge and skills through an in-depth study of the disciplines of clinical laboratory science related to improvement of quality and delivery of laboratory services critical to clinician decision making and patient care. This includes clinical chemistry, hematology, hemostasis, microbiology, infectious disease, immunology/transplantation, immunohematology, epidemiology, emerging trends in clinical laboratory science, education, health policy, models to improve clinical laboratory services, as well as critical analysis and application of research and practice in the clinical setting. This unique program will offer CLS professionals the knowledge to expand their roles as part of the health care team and enhance their clinical assessment and consultation skills. The graduate student will also design, manage and conduct translational, evidence-based research that will contribute to the improvement of patient outcomes, decrease medical errors, and increase efficient and effective utilization of laboratory services by clinicians.

Objectives

The DCLS promotes the general outcomes established for clinical doctorate graduates of UMDNJ-SHRP. In addition, through theoretical and experiential learning, the graduate of the DCLS Program, as an advance practice professional, will be able to:

- Critically review, appraise and synthesize the health sciences literature;
- Identify and systematically investigate research questions pertinent to clinical laboratory practice;
- Synthesize new concepts, models and theories through the appropriate application of empirical knowledge and the scientific method to help resolve clinical laboratory and health sciences issues or problems;
- Apply the advanced knowledge and technical skills needed to serve as active contributors and/or leaders in the clinical laboratory science professions;
- Apply current knowledge to evaluate or design more effective ways to deliver clinical laboratory and health-related services;
- Use a variety of information technologies to address both theoretical and practical problems, enhance communication, and disseminate knowledge to applicable audiences and interest groups;
- Demonstrate proficiency in both oral and written communication, using both scholarly and technical formats;

- Work collaboratively with others to advance the scientific bases of knowledge in clinical laboratory science via ongoing scholarship;
- Integrate basic principles of ethics and cultural sensitivity within all interpersonal and professional activities.

Program Competences

A Task Force of the American Society for Clinical Laboratory Science (ASCLS) developed a model curriculum during a two-year evaluation of doctorate programs in the specialty areas of clinical laboratory science and parallel curricula in other allied health professions.[1] The ASCLS Board of Directors and the Education Section of the ASCLS Scientific Assembly as well as representatives from the National Accrediting Agency for Clinical Laboratory Sciences and the fields of Clinical Microbiology, Clinical Chemistry, and Clinical Pathology vetted this model. The following competencies were developed by the ASCLS Professional Doctorate Task Force, and accepted by the Graduate Task Force of the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).[2] All general competencies stated shall be achieved in course experiences:

1.0 Patient Care

1.1 Work effectively with all health care professionals to provide patient-centered care.
1.2 Create and sustain a therapeutic and ethically sound relationship with patients.
1.3 Appropriately adapt communication style and messages to the context of the individual patient interaction.
1.4 Demonstrate caring and respectful behaviors when interacting with patients and their families.
1.5 Gather essential and accurate information about their patients.
1.6 Provide and coordinate patient and family centered health care services and education within inpatient, outpatient, and non-patient settings.
1.7 Provide health care services and education aimed at preventing health problems or maintaining health.
1.8 Obtain and apply information about the local/regional population of patients and the larger population from which their patients are drawn.
1.9 Manage through ordering, interpretation, or supervision laboratory tests that monitor physiological function.

2.0 Interpersonal and Communication Skills

2.1 Work effectively with all health care professionals as a member or leader of a health care team or other professional group.
2.2 Apply an understanding of human behavior to interactions with all health care professionals.
2.3 Demonstrate emotional resilience, flexibility, and tolerance of ambiguity.
2.4 Accurately and adequately document and record information regarding the care process for medical, legal, quality, and financial purposes.
2.5 Use information technology to support local, regional, and national health care decisions.
2.6 Use effective listening, nonverbal, explanatory, questioning, and writing skills to elicit and provide information.

3.0 Professionalism

3.1 Explain the legal and regulatory requirements, as well as the appropriate role of a Doctor of Clinical Laboratory Science within all healthcare environments.
3.2 Maintain professional relationships with physician and other health care providers.
3.3 Be responsive and accountable to the needs of patients, society and the profession.
3.4 Treat patients and co-workers with respect, compassion, and integrity.
3.5 Abide by ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.

3.6 Demonstrate sensitivity and responsiveness to patients' current medical status, culture, age, gender, and disabilities.
3.7 Engage in self-reflection, critical curiosity, and initiative in the pursuit of professional improvement education.

4.0 Outreach
4.1 Integrate research to promote evidence-based practice for patients with complex acute, critical, and chronic illnesses.
4.2 Integrate the DCLS role into systems, processes, and decision making to function fully within the health care team.
4.3 Serve as a knowledge resource in the design and development of laboratory services for the complex acute, critical, and chronically ill patients.

5.0 Continuous Practice Improvement
5.1 Perform practice-based improvement (evidence based practice) activities alone or in concert with other members of the health care delivery team.
5.2 Locate, appraise, and integrate evidence from scientific studies related to patients' health problems.
5.3 Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information to maximize treatment decisions and patient outcomes using diagnostic and therapeutic laboratory procedures.
5.4 Apply information technologies to manage information, access online medical information, and support personal continuing education.
5.5 Recognize and appropriately address gender, cultural, cognitive, emotional, and other biases; gaps in medical knowledge; and physical limitations in themselves.
5.6 Effectively interact with different types of medical practice and delivery systems.
5.7 Practice cost-effective health care and resource allocation without compromise in quality of care.
5.8 Partner with supervising physicians, health care managers, and other health care providers to assess, coordinate, and improve the delivery of health care and patient outcomes.
5.9 Accept responsibility for promoting a safe environment for patient care.
5.10 Recognize and correct systems-based factors that negatively impact patient care.
5.11 Apply medical information and clinical data systems to provide more effective, efficient patient care.
5.12 Utilize principles of case management when overseeing and directing health care services for complex acute, critical, and chronic illness.
5.14 Promote efficient use of resources and provision of quality care to achieve optimal cost-effective outcomes.

JUSTIFICATION AND NEED FOR THE PROGRAM

With a plethora of clinical laboratory tests and new molecular methodologies being added to the clinical laboratory test menu, clinicians are challenged with keeping abreast of the latest in laboratory services. The DCLS will serve as a consultant, similar to the PharmD and other allied health professionals who take part in clinical rounding and patient care. Their contribution as the expert in clinical laboratory testing would benefit the clinician and other health care providers by promoting appropriate and cost effective utilization of clinical laboratory services and maximizing patient safety by reduction of medical errors.

This concept has been endorsed by the CDC Division of Laboratory Systems. In Fall 2007, the CDC Division of Laboratory Systems convened a professionally facilitated meeting “The 2007 Institute: Managing for Better Health”. This Institute addressed the wide-ranging goal of improving

the integration of laboratory medicine within the health system. Four main goals were identified at this meeting. One of the goals identified was:

> *"to institutionalize new models of clinical consultation provided by the laboratory medicine professionals to clinicians to guide their decisions about utilization of laboratory tests or services".*

This goal addresses the CDC's vision of a collaborative effort between a DCLS and a more consultative pathologist changing laboratory medicine's contribution to healthcare. Since the initial meeting, CDC has modified the initial four goals down to two. However, this goal has been maintained, emphasizing its importance.[3]

According to the New Jersey Dept. of Labor and Workforce Development, medical/health care is the number one employer of citizens in New Jersey, with a projected 20% growth rate over the next four to six years.[4] The clinical laboratory is responsible for over 70% of the objective scientific data clinicians use to diagnose, treat and monitor patients. Research has shown that the first days of hospital stay consume the most resources, and a reduction in length of stay by one or two days does not have a significant impact on cost savings. It is suggested that cost reduction measures should focus on the numerous processes involved in patient care delivery during the early stages of admission. It is during this critical time that resources are consumed at a high degree, and perhaps, not necessarily in the optimum patient-focused and most cost effective manner.[5]

If a small reduction in pharmacy services through the use of doctoral prepared pharmacists (PharmD) results in a significant reduction in costs, a reduction in inappropriately ordered test would have a similar substantial positive effect in cost containment.[6] A more focused approach to laboratory services, utilizing the DCLS as a member of the interdisciplinary health care team, would have the effect of improving patient outcomes and reducing cost through quality utilization of clinical laboratory services to improve health care. This would have a positive impact on patient outcomes, cost efficiencies, and would influence health care nationwide.

As newer technologies become available, older tests that have been relied upon for decades become less relevant in some areas of medicine but remain critical assessments in others. A doctoral prepared CLS professional who understands both the technological issues and the needs of the physician to monitor patient care would be able to develop menus of laboratory testing that are appropriate to the patient population of a facility. By providing targeted, specific test menus, costs are contained and quality of care increases. Additionally, a doctoral prepared professional is best suited to engage physicians and other health care providers in continuing education concerning laboratory advances and their impact on patient care.

A doctoral prepared clinical laboratory scientist will also be of benefit in the realm of patient advocacy. As physicians are continually constrained by external forces to shorten their encounter time with patients, patients are now seeking explanations of laboratory testing in a variety of settings. For example, ten years ago the American Society for Clinical Laboratory Science (ASCLS) implemented a consumer information web page designed to personally reply to patients concerned about their laboratory tests. In ten years, the average daily inquiry rate is approximately seventy-five (75) questions with approximately 10% of the questions coming from physicians who are concerned about pre-analytical (patient preparation and specimen collection, transport, etc.) and post-analytical (interpretation) issues. Clearly these physicians from across the world are sensing a need to speak with a professional educated specifically to integrate patient data and laboratory values. A panel of nationally certified Medical Laboratory Scientists serves on the committee and fields these questions, providing critical information related to understanding laboratory tests.

Another example is the Association of Cancer Online Resource (ACOR.org) which supports 159 different listservs, serving thousands of patients and care givers. Literally millions of emails have been sent. Investigations into these listservs show that many patients/care givers are looking for explanations of laboratory tests and their meaning. With physician/patient interaction pressured, the doctoral prepared clinical laboratory scientist could provide clear explanations of the tests while carefully enhancing the physician/patient relationship. Public education about various diseases and their attendant laboratory tests (e.g., diabetes and A1c-hemoglobin assays) would be just one example.

The utilization of a DCLS would provide quality benefits to the facility in which he/she works. By working with clinicians to develop test algorithms and reflex testing protocols customized to their institutions' needs, cost savings will occur. By decreasing the number of unnecessary tests, turn around time for test results will be shortened. By eliminating older, less sensitive tests in favor of more specific ones, the available test menu would be more efficient and effective for the physician and patient population. In addition, the DCLS can enhance the move for personalized medicine by working with the clinician to customize a test menu that would best serve the needs to assess and monitor individual patients. Though the concept of test algorithms is an accepted practice, no two patients are alike nor do diseases and conditions always meet the textbook protocol. The DCLS working along with the healthcare team can customize the testing needs of patients, particularly those in a critical care setting that present the greatest need and the greatest cost to a facility. The DCLS will assist with interpretation of test panels, explanation of test results specific to a patient's medical situation taking into account false positives/negatives that may result due to physiologic conditions and/or drug and complementary and alternative medicine and supplements which may impact test results. Doctoral prepared clinical laboratory scientists will act in parallel to the PharmD. They will consult with caregivers to select the most appropriate laboratory tests and provide support to the patient during preparation. The clinical laboratory scientist will then be able to provide patient specific analysis of the test result. In addition, this professional will also be able to train patients to perform home/self testing. By participating in rounds, they will be able to anticipate the need for new testing as well as provide day-to-day consultation.

Inter-professional patient care conferences are greatly needed in twenty-first century medical care. These teams usually consist of the admitting physician, hospitalist physicians, nurses, doctoral pharmacists, social workers, and various therapists. Professionals from the clinical laboratory are conspicuously absent from these teams, yet the preponderance of medical decisions (diagnosis, therapy, discharge, etc.) rely on laboratory test results.[7,8,9]

Graduates of the DCLS program will master a variety of research tools. By examining patterns of laboratory test ordering, they would be able to increase the effectiveness of ordering and initiate planning for the most appropriate panel of available tests. Assessment of reflexive test protocols would assure physicians of focused and usable results. Comparison of outcomes based on different modalities of tests would allow for physicians and patients to be assured that their point-of-care testing is aligned with the clinical laboratory's test methods.[7] Translational research can validate test merit and patient outcomes. Evidence based investigations will improve the quality of patient care by decreasing unnecessary or duplicative testing and overall cost.

The DCLS will work primarily in a hospital setting as a specialist in clinical laboratory services. Other avenues of employment are healthcare facilities such as rehabilitation centers and nursing homes, as well a large physician office practices. In addition, the DCLS can provide valuable service in research clinical trials, offering an expertise in laboratory test selection and interpretation and data analysis.

The curriculum provides for a generalist approach. Current PhD prepared CLS professionals are focused on one subset of the clinical laboratory (microbiology, clinical chemistry, hematology, immunohematology, etc.). However, patients often have conditions that require testing across the entire spectrum of clinical laboratory disciplines. For example, as much as a physician worries about the blood glucose level of a diabetic patient, the concerns for cardiovascular disease, renal disease, neuropathy, and peripheral vascular disease are just as important. With the shortage of qualified clinical pathologists, smaller facilities that share pathologists would have the ability to have on site an individual with the necessary expertise to guide laboratory testing. Though several PhD programs are offered in Clinical Laboratory Sciences, none include the clinical component, consultative, administrative, and clinical translational research aspects proposed in the DCLS. At present, other than clinical pathologists, whose numbers are insufficient to routinely provide these services and whose time is occupied by more medically related responsibilities, there is no one who is prepared to bring the entire spectrum of laboratory services to patient care issues on a full time basis. The American Society for Clinical Laboratory Science (ASCLS) strongly supports the movement to a doctorate level of practice and has assisted in curriculum development. [9,10,11,12]

The move towards advanced-level practice degrees as an alternative to the doctor of philosophy is increasing in the health care professions. The PharmD program is the oldest of the practice doctorate programs among the health professions. UMDNJ has precedence for offering practice/clinical doctorates as advanced practice degrees. In 2003, SHRP opened the first clinical doctorate program (DCN) in Nutrition. This web-based program focuses on advanced clinical practice assuring that Registered Dieticians remain integral members of the health care team in any practice setting. This program requires completion of a clinical doctorate residency and a research project. UMDNJ's Department of Rehabilitation and Movement Science offers two Entry-Level Doctor of Physical Therapy (DPT) programs. This is a comprehensive 110 credit graduate program which prepares students for leadership roles within the profession including advanced practice, education, research, patient care and community service. A 2008 report noted 71 DPT programs offered in the United States.[13]

The American Speech-Language-Hearing Association has also developed a clinical doctoral program in audiology on both the post-baccalaureate and post-master levels.[14] Occupational therapy has also instituted a practice doctorate program to prepare occupational therapists that possess the knowledge and skills to become leaders in the practice of occupational therapy.[15] With the expansion of clinical laboratory services and complexity of interaction and interpretation, the time is fortuitous for clinical laboratory scientists to enter the practice doctorate arena and become more active members of the patient care team.

Graduates of the UMDNJ MSHS-CLS program, as well as other practicing CLS professionals have expressed an interest in a doctoral-level degree in CLS that will include a clinical practice focus. Many practitioners wish to pursue higher education and see the need for a clinical doctorate that would focus on clinical practice, consultation and interdisciplinary interaction, as well as elements of research, policy and management. The DCLS will also provide a career ladder for practicing professionals. It will nurture those who are the best and brightest in the CLS profession by preparing them for advance practice opportunities through academic and clinical professional growth. The DCLS will prepare practicing professionals with advanced expert-knowledge and skills, critical thinking proficiency, and interdisciplinary collaboration through the focused clinical residency. The DCLS will also prepare advanced practitioners who will acquire increased skills in evidence-based practice, and research methodologies to conduct translational research in clinical laboratory science.

DEGREE REQUIREMENTS
Total credits: 80 (beyond the baccalaureate degree)

- The **pre-clinical practice component (57 credits)** is fully online. It will generally take full time students 3 years to complete this component, while part time students can complete it in 5 to 6 years.
- The **clinical practice component (23 credits)** is 1 year, full time at an affiliated health care institution supplemented with online seminar courses.
- Full time students can complete the degree in 4 years, while part time students can complete the degree in 6 to 7 years post baccalaureate.

REQUIRED COURSES
Note:
- all courses are 3 credits unless otherwise noted
- all courses are CCCR approved except for those *in italics* which are courses to be developed

Core – Advanced Clinical Laboratory Science Courses - 30 credits
CLSC 5112 Molecular Diagnostics
CLSC 6112 Advanced Topics in Molecular Diagnostics *(pre-req- CLSC 5112)*
CLSC 5134 Clinical Immunology & Transplantation
CLSC 5123 Advanced Hematology
CLSC 5124 Advanced Hemostasis
CLSC 5133 Transfusion Practice
CLSC 5140 Advanced Topics in Clinical Chemistry
CLSC 6274 Infectious Disease
CLSC 5273 Advanced Topics in Clinical Microbiology
BPHE 5510 Overview of Disease Processes & Treatment

Core - Professional Courses - 19 credits
CLSC 6214 Clinical Laboratory Utilization in Quality Healthcare Delivery
CLSC 6215 Healthcare Regulations & Laboratory Management
IDST 5110 Health Services Issues & Trends
IDST XXXX Epidemiology
CLSC 6290 Clinical & Laboratory Diagnosis Correlation
CLSC 7191 – DCLS Seminar I (Summer –2 credits)
- *Physical Assessment (History & physical)*
- *Ethical Issues in HealthCare Practice (selected modules of NUTR 6505)*
- *Principles of Trans-cultural Healthcare (selected modules of IDST 5200)*
- *Teaching in Health Professions (selected modules of IDST 5140?)*
- *CLS Grand Rounds – DCLS student presentations*

CLSC 7292 DCLS Seminar II (Fall - 1 credit)
- *Current Topics & Trends in CLS – research/article review/critique*
- *CLS Grand Rounds – DCLS student presentations*

CLSC 7393 DCLS Seminar III (Spring -1 credit)
- *CLS Grand Rounds – DCLS student presentations*

NOTE: It is anticipated that DCLS Seminar will enroll students from collaborating institutions, thus providing an enriched learning experience with sharing of resources and faculty.

Core- Research Courses – 19 credits
CLSC 5213 Clinical Laboratory Data Analysis
IDST 6121 Data Analysis & Interpretation I
IDST 6200 Research Methods in the Health Sciences
IDST 6400 Evidence-based Literature Review
CLSC 7189 DCLS Project I (Summer - 1 credit)
CLSC 7289 DCLS Project II (Fall - 3 credits)
CLSC 7389 DCLS Project III (Spring - 3 credits)
CLSC 7489 DCLS Project Advisement (if need beyond DCLS Project I, II & III may be 1-3 credits)

Core – Clinical Practice Courses – 12 credits
CLSC 7199 DCLS Clinical Practicum I – (Summer - 2 credits)
CLSC 7299 DCLS Clinical Practicum II – (Fall - 5 credits)
CLSC 7399 DCLS Clinical Practicum III –(Spring - 5 credits)
Note: Last courses taken in the program concurrent with CLSC 7090, 7091. 7119, 7219

Partner Courses that may be taken in lieu of UMDNJ courses:
In Lieu of CLSC 5134:

- BLD 850 Concepts in Immunodiagnostics, 2 credits (MSU)
- BLD 851 Clinical Application of Immunodiagnostics Principles, 2 credits (MSU)

Modules from the following course may be used in the DCLS Seminar course:

- BMB 571 Ethical Issues, 3 credits (UmassD)

Note: this list may expand once collaborating institutions develop additional courses.

Admissions Requirements:

- A minimum of a baccalaureate degree from a regionally accredited college or university in the United States;
- Overall minimum GPA of 3.5
- Graduate Record Examination (GRE) General test scores taken within the last 5 years. Because the GRE is one of many factors in the admission decision, a minimum score cut-off for either the test as a whole or its components will not be applied.
- Professional certification as a generalist Medical Laboratory Scientist from the American Society for Clinical Pathology-Board of Certification, MLS(ASCP)^{CM} with proof of continuing certification maintenance.
- Minimum of five years of clinical laboratory experience in the United States, preferably as a generalist medical laboratory scientist
- Official transcripts of undergraduate and graduate coursework from all institutions attended. International students or students who have earned a degree from a non-US accredited institution must comply with the applicable University and School guidelines.
- Curriculum vitae
- Three letters of recommendation from individuals who have the knowledge to evaluate the applicant's academic and professional performance (2 letters from professional supervisors and one letter from a college professor.)
- Personal statement/essay
- Personal interview (on campus or by video-audio conference)
- Proficiency in written communication to successfully complete frequent writing assignments, exams, and papers required in the curriculum (GRE, Personal statement/essay)
- Proficiency in oral communication (Personal interview on campus or by video-audio conference)

BENEFITS TO THE UNIVERSITY

SHRP Mission:
"In achieving our mission, vision and values, the UMDNJ-School of Health Related Professions will expand its high quality offerings to better meet the growing needs of entry level and advanced level students. The priorities will be education, followed by research and community service. The School stresses a humanistic approach to education and client care. The School's partnerships with academic units and the health care agencies will increase and expand nationally and internationally. The School will be recognized as leaders in allied health, education and research. Finally, the School will provide innovative solutions to improve the health status of the public."

For more than 30 years, the Department of Clinical Laboratory Sciences (Dept of CLS) has provided high quality education to the citizens of New Jersey and across the nation. The Dept of CLS has educated individuals who are recognized as leaders in the profession. Adding the Doctorate in Clinical Laboratory Science will enhance the education offerings UMDNJ provides to practitioners working in the field. Currently, entry level and advanced degree programs in CLS are offered. The post high school certificate program in Phlebotomy, and the joint baccalaureate degree program in Clinical Laboratory Sciences offer entry level access to the field at an undergraduate level. The Master of Science in Health Sciences, Clinical Laboratory Science Track (MSHS-CLS) is an online degree providing advanced education to certified practitioners.

Adding a doctoral program would support the mission of the school to enhance educational innovation and provide additional leaders for the health care delivery system. While maintaining entry level access to the profession at the undergraduate level, and offering the master's degree to further enhance education and CLS practice, the DCLS would complete the academic portfolio for medical laboratory scientists by providing a mechanism for experienced, practicing professionals on a part time or full time basis, regardless of location, to gain access to doctoral-level practice within the profession, a possibility that currently does not exist.

The DCLS will offer an innovative educational experience utilizing a blended pedagogy, distance education technology, and clinical practice. This design will meet the SHRP goal to "create an academic and clinical educational environment that values interdisciplinary education and practice." The curriculum includes interdisciplinary courses which will provide students the opportunity to interact with other health care professionals. The clinical practice component will further enhance this interaction.

The research component of the curriculum meets the goal to "support growth of scholarship and research at SHRP and increase opportunities for interdisciplinary and collaborative research." The role of the DCLS professional in health care will fulfill the SHRP goal to "promote concepts of wellness/health promotion to our faculty, staff, students, the UMDNJ community and the community at large and provide community services to increase awareness of allied health professions and serve underserved populations."

Finally, our model for the DCLS is unique. Currently there are no programs of this type offered in the United States. UMDNJ would be the first institution to offer this advanced practice degree. That would establish UMDNJ as the premier institution for advanced CLS degrees and a leader in clinical doctorate education. The DCLS is innovative in the multi-campus design that fits with the national profile for this degree at this time. We would not only be participants, but would be leaders in the development of this educational model. This will provide a unique and powerful means for UMDNJ-SHRP to realize a core goal to "increase the School's name recognition within New Jersey, nationally and internationally as an integrated part of UMDNJ."

BENEFITS OF THE DCLS

Clinical pathology is the division of the medical laboratory where tests are performed on blood and other body fluids. The majority of the work is performed by non-physician baccalaureate medical laboratory scientists. Results of clinical testing are reported directly to patient care providers who use those results in the diagnosis and treatment of patients. The lack of interpretative reporting common in radiology, medical imaging or anatomic pathology, contributes to medical errors and inappropriate or inefficient use of clinical laboratory testing. When the timeliness of therapy is compromised, patients are at risk.[16] Various studies have highlighted the foci of laboratory errors as pre-analytical (selection, ordering and/or patient preparation) and post analytical (interpretation). When tests are ordered inefficiently or are incorrectly used, patients may experience additional expensive testing or delays in the initiation of appropriate therapy.[16,17] Improper test selection and patient preparation, and mis-interpretation of laboratory tests costs patients in time, treatment, and money. Pathologists recognize the need for improved utilization of laboratory services, and the Doctorate in Clinical Laboratory Science can meet this need.[18]

EVIDENCE OF STUDENT DEMAND

A recent survey sent to 975 medical laboratory scientists (response rate 30%) showed that 65.2% of the respondents would be interested in pursuing a doctorate degree in clinical laboratory science and that 28% thought it would be a good option for laboratory practitioners who currently choose to become physicians or physician assistants.[19]

At a professional organization level, interest levels are high as evidenced by the number of medical laboratory scientists attending meetings at which the development of this program has been discussed.

Currently, graduates of the DCLS program would face an unusual position upon graduation. As with the PharmD individuals, they will have to prove their worth to an employer on the job.[20] Studies continue to show that the investment in doctoral prepared pharmacists save patient lives, time and money.[21,22]

STUDENT POOL

Currently, the Dept. of Clinical Laboratory Sciences offers a career-ladder for CLS professionals with a well-established entry level program (BS in CLS) and an MS in Health Sciences – Clinical Laboratory Science Track. It is anticipated that students will be drawn from the MSHS-CLS alumni (currently more than 30 graduates), graduates of other master's programs in clinical laboratory science across the United States, and individuals who are non-master's prepared CLS professionals. As a distance program, the DCLS will be able to attract students from across the United States. Although the program is designed for the baccalaureate-prepared medical laboratory scientist, it is likely that many of the first-enrolled students will be alumni of the MSHS-CLS and other master's programs. In addition, graduates of UMDNJ's MSHS-CLS program, who enter the DCLS within five years of graduation, can apply 21 to 27 credits from their MSHS program to satisfy course requirements for the DCLS degree.

INITIAL ENROLLMENT

Initial enrollment will be 4 students per year in the pre-clinical component of the program. From years 3 to 5 of the program, it is anticipated that 2 to 3 students per year will be enrolled in the clinical practice component.

PROGRAM RESOURCES

In the initial 2 to 3 years, the program will utilize the existing Dept of CLS faculty (full time and adjunct) and the existing department administrative coordinator. The Dept of CLS currently has five full time doctoral level faculty (4 PhDs and 1 MD pathologist). Once the program is approved, a Program Director for the DCLS Program will be required but would be selected from among the current faculty in the department. After year 3, it is anticipated that a 0.5 FTE faculty and a 0.5 FTE administrative assistant will be required.

The major cost of the program during this time will be promotional materials for recruitment of potential students and costs for adjunct faculty to develop and teach several new courses and to assist in teaching online graduate courses when enrollment exceeds 20 students. It is anticipated that some courses in the MSHS-CLS will have an increase in enrollment due to DCLS students from UMDNJ as well as from the three other collaborating universities.

Seventeen (17) of the twenty-eight(28) courses in the curriculum are already in existence. Eleven (11) new courses are proposed and include epidemiology (3 credits) which is currently under development by an interdisciplinary faculty team; a clinical laboratory correlations course (3 credits); three seminar courses (4 credits) which are proposed to include modules from other existing courses; three DCLS project courses (7 credits) which can be modeled from existing graduate project courses, and three clinical practice courses (12 credits). Initially we will affiliate with health care institutions in the metropolitan area. However, long range plans include affiliations with major health care institutions throughout the country.

Library resources, educational technology, student advising and support services, space and other facilities are all currently adequate to support this new program.

REFERENCES

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