

**PROPOSAL FOR A REVISED ENTRY-TO-PRACTICE DEGREE
PROGRAM**

AT THE

LESLIE DAN FACULTY OF PHARMACY

April 2, 2008

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I Introduction

Over the last three years, the Leslie Dan Faculty of pharmacy has had ongoing discussions about a renewed curriculum. The current undergraduate program provides a high quality education for our 240 pharmacy graduates to meet the drug-related health care needs of Ontario's residents. This program was originally developed in 1994. Since then, although ongoing curricular changes within our program have continued to occur, the program now requires significant change to its structure and delivery.

One of our main goals, as identified in the 2004 Strategic Plan¹, is: **To lead the nation in offering the most innovative and leading-edge educational programs in pharmacy, making these programs accessible to a greater number of qualified applicants.** With the many evolving changes within the health care system and the profession, our leading-edge program from the 1990s, while still strong, will not adequately prepare our graduates to meet the changing health care needs of Ontario's citizens.

This document outlines the rationale for a curricular change, in conjunction with a change in the entry-to-practice degree from a baccalaureate in pharmacy (BScPhm) to a doctor of pharmacy (PharmD) and the associated curriculum, which will place our graduates at the leading edge of pharmacy programs in Canada and internationally.

II Rationale for a Renewed Curriculum

Changing needs of Ontario's citizens

The proportion of elderly in our community is growing at a significant rate with the projected demographics for Canada indicating that by 2019, one in five Canadians will be over 65 years of age. The elderly have more chronic conditions, are on more medications, and have a greater potential for experiencing adverse drug events. This is partly due to the complexity of health issues in a geriatric patient, including an enhanced response to some drugs.

Research indicates that almost one-half of all patients visiting a community pharmacy or a clinic will have a drug therapy problem.² The most common types of problems seen in practice usually relate to patients receiving too low a dose of a drug, or patients requiring additional therapy to optimally manage their condition, or an adverse drug reaction.² Pharmacists' interventions in addressing these problems can result in positive outcomes (resolution or improvement) and has shown to decrease unnecessary clinic visits and, in some cases, hospitalizations.²

Patient Safety is becoming an important consideration within our health care system. Within this, safe medication use is of paramount importance. Medication cost is the fastest rising expenditure within our health care system³ and with increased use comes a greater potential for adverse drug events. In the United States, the Institute of Medicine reports 1.5

¹ 2004 Strategic Plan, Leslie Dan Faculty of Pharmacy, University of Toronto

² P. 40, Pharmaceutical Care Practice – The Clinician's Guide, Cipolle RJ, Strand LM, Morley PC. The McGraw-Hill Companies, Inc. New York, 2nd edition, 2004.

³ Nigam R et al. Development of Canadian Safety Indicators for Medication Use, Healthcare Quarterly Vol 11 Special Issue, 2008

million preventable adverse drug events with an annual cost of \$3.5 billion.⁴ In Canada, Baker⁵ et al. demonstrated that there are a significant number of adverse drug events in hospitalized patients which are preventable. This need, to optimize drug therapy in patients, will be even greater in the next 10-20 years with a significant increase in the aging population.

Another potential reason for adverse events is the increase in self-medication use by Canadians, with more therapies being available over-the-counter, as well as an increase in the use of natural health products. This requires pharmacists to be able to provide evidence-based, balanced information to patients, assess these therapies in light of their prescription medications, and ensure close monitoring of patients, with referrals to their physicians and other health care providers as appropriate.

Changes in the health care environment

In addition to the changing health care-needs of Canadians, the health care environment continues to evolve with a strong move in health service delivery to team-based approach to care. There also continues to be an increasing focus on primary care and health promotion strategies. More consistent assessment of drug therapy for patients in the community is essential as the rate of adverse events occurs four times as often in the community setting vs. institutional setting.⁶

Changes in health care delivery are starting to be reflected with changes in provincial legislation as well. Within Ontario, with the introduction of the Transparent Drug System for Patients Act, 2006 (TDSPA) which became effective on April 1, 2007, certain pharmacist-provided direct patient care services are now recognized (traditionally, payment has been linked to the dispensing function only). As Phase II and III of this program roll out, pharmacists in the community setting will be recognized for their contribution to the assessment of patients' drug therapy, and identification and resolution of drug therapy problems. However, in order to provide this level of care, pharmacists will need additional training to have the required qualifications.⁷

In conjunction with the TDSPA, the Ontario's Health System Improvement Act allows for expansion of health care services with recognition of pharmacy technicians as regulated health professionals. This will enable technicians to dispense medications, thus allowing pharmacists the time to provide care to patients, without being encumbered by the

⁴ Aspden P (Ed) Preventing Medication Errors. Washington: Institute of Medicine, 2006.
www.iom.edu/object/file/Master/35/943/medication%20errors%20new.pdf

⁵ Baker, G.R., P.G. Norton, V. Flintoft, R. Blais, A. Brown, J. Cox, E. Etchells, W.A. Ghali, P. Hebert, S.R. Majumdar, M. O'Beirne, L. Palacios-Derflingher, R.J. Reid, S. Sheps and R. Tamblyn. 2004. "The Canadian Adverse Events Study: The Incidence of Adverse Events among Hospital Patients in Canada." Canadian Medical Association Journal 170(11): 1678–86.

⁶ Nigam R et al. Development of Canadian Safety Indicators for Medication Use, Healthcare Quarterly Vol 11 Special Issue, 2008

⁷Ministry of Health and Long-Term Care, Ontario Public Drug Program, Pharmacists' Professional Services Working Group
http://www.health.gov.on.ca/english/providers/program/drugs/councils/councils_resources/pharm_council_pst_to_r09122007.pdf

dispensing function. Other provinces have introduced similar and additional legislative changes with expanded role for pharmacists (e.g. limited prescribing authority).

A national discussion within the profession is responding to the many changes within health care and recognizes the need for enhanced training for pharmacists. A task force⁸ comprised of representatives from pharmacy organizations from across Canada sees pharmacists as:

- “medication experts committed to patient-centred, outcomes-focused care”
- “tak(ing) increased accountability and responsibility for the safe and effective use of medications”
- “promot(ing) wellness and disease prevention, and empower(ing) patients, in collaboration with other health professionals.”

What can pharmacists do to address these needs?

Pharmacists can effectively work with patients and their health care providers to identify, resolve and prevent problems related to drug therapy. The pharmacist’s role in specific types of clinics has been shown to be effective in minimizing cost and drug-related morbidity (e.g. management of diabetes, hypertension, etc.). In a clinic practice⁹, pharmacists providing care to 2524 patients, identified and resolved 5780 drug therapy problems. Pharmaceutical care improves health outcome, minimizes drug costs, as well as health care expenditure.⁹ However, research in pharmacy practice indicates that most pharmacists may not be ready for this type of practice. The IMPACT study¹⁰, a large-scale demonstration project supported by the Ontario Primary Health Care Transition Fund, indicates that graduates and practicing pharmacists require additional training in order to work effectively within team-based practices, while providing direct care to patients. In Alberta where legislation authorizing pharmacists to prescribe came into effect in April 2007, the Alberta College of Pharmacists has determined that pharmacists will need an evaluation process to obtain authorization for prescribing, rather than granting this authority to all pharmacists.¹¹ Part of this training entails that students have the opportunity to ‘practice’ more in various types of sites (such as ambulatory care, community pharmacy, institutional pharmacy, Family Health Teams and long-term care). As this evolving role in direct patient care is relatively new to pharmacists, expanded authentic on-site training for our students will enable them to gain the required skills to provide this care.

The University of Toronto – impact of a renewed pharmacy curriculum

A renewed curriculum will incorporate changes to the content, as well as to teaching and assessment methodologies. These changes will include teaching in smaller classes for

⁸ Blueprint for Pharmacy – Designing the Future together, CPhA, http://www.pharmacists.ca/content/about_cpha/whats_happening/cpha_in_action/blueprint_consult.cfm

⁹ P. 61, Pharmaceutical Care Practice – The Clinician’s Guide, Cipolle RJ, Strand LM, Morley PC. The McGraw-Hill Companies, Inc. New York, 2nd edition, 2004.

¹⁰ IMPACT Study (Integrating Family Medicine and Pharmacy to Advance Primary Care Therapeutics) <http://www.impactteam.info/about.html>

¹¹ Alberta College of Pharmacists <http://www.pharmacists.ab.ca>

some courses, increased collaboration with our affiliated institutions and the community, and a greater partnership with our clinicians. To enable the enhanced training required in the new curriculum, Communities of Pharmacy (CoP) will be developed with practice institutions and our community partners (see pg 20). Development of the CoP will enable the Faculty to further enhance scholarship in the pharmacy practice area. Pharmacy practice research and the role of the pharmacist as a researcher has been identified as being essential in ensuring better health for patients, by both the World Health Organization (WHO) and the International Pharmaceutical Federation (FIP).¹² The changes brought forward in the renewed curriculum are consistent with the priorities set out by the University's Stepping Up¹³ academic plan and will enhance our students' experience, link education and scholarship, and in the long-run, impact public health policy.

Towards 2030¹⁴ discusses the changing face of higher education globally and the importance of developing partnerships internationally. With the rapid changes in health care and the pharmacy profession, many international schools have upgraded their programs and recognized the need for enhanced training for pharmacists. In the United States of America, as of 2000, the entry-level PharmD is now offered as the sole entry-to-practice degree in all 100 schools of pharmacy. Countries in Europe who have signed up to the Bologna Process, have moved to, or will be moving to, a European Higher Education Area (EHEA), based on a 3-cycle degree system.¹⁵ Based on the number of credits, this process creates standards for higher education, enabling recognition of degrees across countries. Many countries in Europe, such as France, Italy and the Netherlands, currently offer a doctor of pharmacy degree, which may become the common degree in EU over time. Throughout the EU, the pharmacist is now seen as a key member of the health care team, with defined medication management activities. The pharmacy program at the Leslie Dan Faculty of Pharmacy needs to move in line with the international changes so that it is renowned globally and attracts international partners in research. The renewed pharmacy program will be consistent with the University's mission statement, offering a professional program of excellent quality at an internationally significant research university.

Curricular Renewal

As the health care needs of Ontario's citizens continue to evolve, so must the education that we offer in preparing our graduates for an evolving practice. Pharmacists have a unique set of knowledge and skills related to pharmacology, medicinal chemistry, pharmaceuticals, pharmacokinetics, toxicology, and therapeutics, which are essential in optimizing an individual's drug therapy. Pharmacists will need to become increasingly responsible for patient care as an integrated member of the healthcare team, and to be accountable for patients' drug therapy outcomes, leading to a decrease in drug-related events and costs associated with them. Future graduates will be required to be both competent and confident

¹² World Health Organization <http://www.who.int/medicinedocs/index.fcgi?a=d&d=Js2214e.3.2#Js2214e.3.2>

¹³ Stepping UP, <http://www.steppingup.utoronto.ca/>

¹⁴ Towards 2030, Planning for a Third Century of Excellence at the University of Toronto <http://www.towards2030.utoronto.ca/documents.html>

¹⁵ Anderson S. How British pharmacy practice is likely to be affected by changes in Europe. The Pharmaceutical Journal (Vol 279), September 1, 2007:242-244. www.pjonline.com

in the role of drug expert and an interprofessional partner in provision of high-quality drug therapy.

III Process involved in Curricular Change

In 2006, Dr. Nancy Waite was hired to develop a plan for implementation of an entry-level PharmD (ELPD) program, which would have run in conjunction with our BScPhm program. The intent was to offer this program to a small number of 40-60 students, who would be admitted after completing 2 or 3 years of the current BScPhm curriculum. Dr. Waite consulted with internal and external stakeholders and documented key concepts and changes required for students in an ELPD program.¹⁶ Based on these discussions and input from stakeholders, the Faculty decided in January 2007 that, while the proposal for an ELPD program was being considered, the current BScPhm program should be revised and updated to reflect changes in practice. This would necessitate major changes to all four years of the curriculum. Dr. Lalitha Raman-Wilms was asked to lead the renewal of the BScPhm program for the Faculty.

Working groups, consisting of faculty, students and recent graduates, were tasked with developing core components of the revised pharmacy curriculum. The work done by these groups was reviewed by both the Curriculum Renewal and Decanal Committees (see Appendix I). An advisory group was also created to provide feedback and advice to the Project Leader. This group consisted of the Dean/Acting Dean, Associate Deans, Chair of Curriculum Committee, and Director of the PharmD program. Feedback and suggestions from the Advisory group and the committees were integrated into the process. Additionally, a website was developed to facilitate communication between working group members and faculty, and regular updates were provided via emails and information sessions.

Based on the draft curriculum brought forward to the Advisory Group and the Curriculum Renewal Committee, the recommendation was made that the renewed curriculum would be best brought forward as an entry-level undergraduate professional doctor of pharmacy program (ELPD) for all students. The following motion was approved by Faculty Council in December 2007: ***The Leslie Dan Faculty of Pharmacy move toward the development of an entry-level PharmD program as its entry-to-practice professional degree program.***

IV Goals: Proposed Entry-to-Practice Degree Program

The overall goal of the new curriculum is to enable our graduates to meet the future drug therapy-related needs of Ontario's citizens. This will require them to effectively provide pharmaceutical care within the context of interprofessional teams in various patient care settings. Graduates will need to be competent and confident in working in partnership with patients in order to assess their drug therapy and identify and resolve medication-related problems, and also to work collaboratively with members of the health care team to optimize patients' medications. This will require graduates to become effective educators – enabling

¹⁶ Report on the Plan for Implementation of the Entry-level PharmD Program at University of Toronto, Nancy Waite PharmD FCCP, January 24, 2007

the understanding of complex drug information by both patients and health care providers. In addition to these competencies, graduates will also have additional responsibilities related to society and to the profession. Professional responsibilities include education of patients, peers, and health care providers, and to actively participate in the development of ethical health care policy through their involvement in professional organizations. Societal responsibilities relate to the role of the pharmacist in actively contributing to health related research and in contributing to the effective utilization of our health care resources.

V Objectives of the renewed entry-to-practice pharmacy program

Based on the overall goal of the program, the graduates of this program will meet the educational outcomes¹⁷ outlined by the Association of Faculties of Pharmacy of Canada (AFPC) for an entry-level doctor of pharmacy program (see Appendix II). The new program will require a change to the minimum prerequisites, adding requirements in physical chemistry, organic chemistry, biochemistry and statistics courses.

By significantly enhancing the training of our graduates, we will prepare them to more effectively meet the evolving drug-related needs of Ontario's citizens. This new curriculum, which is proposed for implementation in September 2010, will see its first graduates entering the profession in June 2014.

Degree Change

Congruency with current pharmacy degree programs in the USA and Quebec¹⁸ will help to clarify training requirements with colleagues in these locations and provide improved access to advanced specialty residency and fellowship opportunities in the USA.¹⁵ At present, U of T graduates completing a BScPhm degree do not have the opportunity to enter directly into programs since those now require a PharmD degree.

In summary, the renewed curriculum, in conjunction with a degree change, will place our curriculum in the leading-edge of pharmacy programs, both nationally and internationally. It will:

- ensure that our students are 'practice-ready' to meet the future expectations of Ontario's citizens within our evolving health care system
- enable our graduates to contribute to a more efficient health care system by identifying and resolving patients' drug therapy problems with the goal of optimizing drug therapy.
- allow students to step into different team-based practice environments
- enable them to take on new clinical responsibilities as needed, such as medication prescribing
- enable our students to pursue advanced training in the US and elsewhere, including specialized fellowships and residencies

¹⁷ AFPC Educational Outcomes for entry-level Doctor of Pharmacy graduates in Canada, May 31st, 2007. http://www.afpc.info/downloads/1/Entry_level_PharmD_outcomes_AFPCAGM2007.pdf

¹⁸ University of Montreal implemented all PharmD program in September 2007; University of Laval to implement in September 2008.

VI Overview of Changes in the New Curriculum

Significant changes in the new curriculum include both the content and delivery of the program. Student assessment and evaluations will need to be aligned with the objectives for each of the courses, as these are developed further. Key changes include the following:

- development and delivery of Integrated Pharmacotherapy Modules
- redesigning of all Pharmacy Practice courses with additional content areas
- incorporation of a critical appraisal series
- significant enhancement in the training and delivery of Experiential programs
- cross-curricular components in: Pharmaceutical Care, Professional Ethics, Patient Safety, Communication Skills and Professionalism
- Interprofessional education (IPE) to be offered in each year of the program
- Opportunity to take several elective courses

Integrated Pharmacotherapy Modules

A significant change is being proposed in the delivery of pharmacotherapeutics. The pharmacotherapeutic courses will be aligned and integrated with the following courses: pharmacology, pathophysiology, clinical biochemistry, clinical pharmacokinetics, clinical toxicology, relevant pharmaceuticals and medicinal chemistry. Students will also be expected to apply principles of evidence-based pharmacotherapy within these modules. In preparing students for these modules, foundation courses in pharmacokinetics and pharmaceuticals will be delivered in the early years. The principles of Pharmaceutical Care will underlie teaching and learning in all therapeutic modules and in the curriculum in general.

Please refer to Appendix III for the proposed format for the Integrated Pharmacotherapy Modules.

Pharmacy Practice Courses

The Standards for Pharmaceutical Care Practice¹⁹ will guide the structure and delivery of pharmacy practice courses and students will be taught progressively on how to care for patients. The experiential components of the curriculum, as well as the pharmacotherapy modules, will be closely linked to the pharmacy practice courses. A series of eight practice courses will be delivered from years one to three. In addition, a Teaching course (year 3) and a Pharmacy Practice Seminar (year 4) are also proposed. Practice courses will include lectures, laboratory, and self-study components. Some concepts related to the teaching of Pharmaceutical Care will be adopted, with permission, from the Faculty of Pharmacy, University of Minnesota. For all laboratory courses, each class of 240 students will be divided into 4 groups of 60 (Lab sections A, B, C, D)

Content areas to be covered within the practice courses are outlined in Appendix IV.

Critical Appraisal Series

Critical appraisal will be taught in specific courses and application of these concepts will be required in other courses such as pharmacotherapy and pharmacy practice, and during experiential training. In year 1, students will receive an overview of biostatistics and an introduction to pharmacy informatics. This will be followed by critical appraisal courses in years 2 and 3.

¹⁹ Standards of Practice for Pharmaceutical Care. Pharmaceutical Care Practice – The Clinician's Guide, RJ Cipolle, LM Strand, PC Morley. 2nd edition, The McGraw-Hill Companies, Inc. 2004; pp:359-366.

Experiential Training

The delivery of experiential training will be significantly different from the current SPEP (Structured Practice Experience Program) model. Experiential training for all 4 years will be delivered within a Community of Practice (CoP),²⁰ which will include several sites. A typical CoP will consist of 4-5 institutions, 20 community pharmacies, and 10 primary care and other direct patient care practice sites (such as Family Health Teams, Community Health Centres, Long-term care). In addition, specialty sites may support several CoPs. The Faculty proposes the development of six CoPs within Ontario to facilitate the experiential training for 240 students. Each CoP will oversee the training of 40 students from each year of the program. This will enable students to 'belong' to the same group of sites through their four years of undergraduate training.

Please refer to Appendix V for an overview of Communities of Practice.

Interprofessional Education (IPE)

All health science Faculties will be required to include IPE content within their curricula. Currently, students have a 3-hour IPE session in year 1 and a 20-hour module on Pain management taught in year 3. In addition to these, the Faculty plans on working with other health science Faculties in creating opportunities for IPE throughout the four years. During clinical placements, all students will be required to carry out at least one direct patient care rotation within an interprofessional context.

Electives

Electives will be offered to students in years 2, 3 and 4. Courses offered in years 2 and 3 will generally be 0.25 FCE with 18 to 22 hours of contact time. Year 4 electives will involve direct patient care and non-patient care rotations such as drug information, industry placement, or a research rotation. Students can take up to 3 elective rotations (12 weeks).

Teaching and Assessment

With respect to the delivery of courses, there will be greater emphasis on the following:

- the integration of content to enhance student learning (e.g. Integrated Pharmacotherapy Courses)
- Active learning incorporated throughout the program
- Incorporation of self-directed learning and self-assessment skills

²⁰ Communities of practice represent a model of teaching, learning, and assessment that involve an entire group of individuals, both teachers and learners, at many different sites. The individuals within the sites and the sites together form a Community of Practice (COP).

VII Admission Requirements

The following pre-requisites are recommended for the new curriculum (bolded items include new criteria):

- Biology University level (1 FCE)
- Calculus University level (equivalent to U of T MAT 135 Y1)
- Chemistry University level (equivalent to U of T CHM 138H1 and 139H1)
- English (OAC 1 or ENG4U)
- Physics (OAC or SPH4U or University)
- **Physical Chemistry - University level (equivalent to U of T CHM220H1) (0.5 FCE)**
- **Biochemistry - University level (equivalent to U of T PHM 225) (0.5 FCE)**
- **Statistics - University level (equivalent to U of T STA220H1) (0.5 FCE)**
- **Organic Chemistry - University level (equivalent to U of T STAT220H1) (1 FCE)**
- 1 course in Social Science or Humanities - University level (1 FCE)
- **Demonstration of a minimal level of competence in all four components of communication skills: reading comprehension, writing, listening and speaking**
 - Ensuring that all students coming into the program have control of expression which does not interfere with understanding will ensure that students have the ability to learn the specific skills required of pharmacists in our curriculum

In addition to ensuring that students have the required course pre-requisites, the following are recommended:

- PCAT assessment (with defined cut-offs for each component as discussed by Pharmacy Practice Working Group).
- Review the need for Interviews to assess verbal communication and other soft skills (task force currently working on this)
- Computer Literacy: Information and Computer literacy
- Information technology will be incorporated extensively within courses. It is essential that students admitted to the program are computer literate. A recommendation is to have the Faculty include information related to this on the admissions website

X Resource Implications

New courses

There will be several new courses which will be developed or modified from existing courses. Preliminary discussions have been underway to determine how best to modify/develop these and for some, individuals have been identified who can assist with this. For e.g. a new course combining human anatomy, physiology and histology (1.0 FCE) will need to be developed for pharmacy students. Currently these courses are taught in years 1 (anatomy, histology) and 2 (physiology) by faculty members from medicine. Discussions with Dr. Dee Ballyk (instructor for anatomy and histology) and Dr. Martin Wojtowicz (physiology) indicate that the two FCE courses can be combined into a one FCE course, while ensuring that the core content is covered. Although some development costs will be involved, teaching costs will be decreased with a decrease in contact time.

Development and Coordination of Pharmacotherapy Modules: Eight courses are proposed within pharmacotherapy (consisting of 10 modules). Each course will require a faculty member from Pharmaceutical Sciences and from pharmacy practice as co-coordinators. One individual can coordinate more than one of these courses and it is anticipated that our current faculty can accommodate these courses, with the support of status clinical faculty.

Double Teaching

Some double-teaching is anticipated in the first couple of years in some areas. There may be some minimal costs required for this on a temporary basis.

Admissions process The need for interviews is currently being evaluated by the Faculty. This will be considered in more detail as this process rolls out.

Development of Experiential Sites and Communities of Practice Coordinators

The experiential training will be a significant component of the new curriculum (49 weeks) and will require resources for development of the program. Once the curriculum has been approved, the recommendation is to hire a Director of Experiential Program. This individual will need to work closely with directors/managers, practitioners and others at sites to coordinate the development of six Communities of Practice (CoP) throughout Ontario. Six on-site coordinators (0.5 FTE each) will then need to be supported by the Faculty. These individuals along with others involved in the experiential programs will need to work closely to develop the experiential components of the curriculum. The current funding for SPEP will be diverted towards others costs involved in the implementation.

Faculty Development

Support for faculty and preceptors will be required in preparation for teaching and assessing students in the new program. The specific needs will be identified as the program is developed.

XI Implementation Considerations

A well-formulated **implementation plan** will enable us to effectively develop and deliver this new curriculum. A recommendation is to have an implementation team consisting of 3 or 4 faculty members in place (who have time assigned for curriculum development); this team can support faculty and help in the development of the program.

Director / Coordinator of Experiential

Once the curriculum receives approval, an experiential director/coordinator needs to be in place who can dedicate their time to the development of Communities of Practice. Once the CoPs are determined, site coordinators should be in place to assist in the training of preceptors and development of student rotations.

Phasing out of the post-baccalaureate Doctor of Pharmacy Program (PharmD)

Depending on when final approval for the new curriculum is received, a plan should be in place for phasing out the current face-to-face and flexible PharmD program. If the curriculum is implemented in September 2010 as planned, students from the current PharmD program will need to graduate prior to June 2014.

Bridging Program: The current distance PharmD program will require modifications to roll out as a bridging program for pharmacists. The start date for this program will depend on the date of implementation of the new program and the minimum time required for training pharmacists (students from the bridging program can graduate at the same time or any time after, the first graduation date of students in the ELPD program).

Administrative Support:

Administrative support will be required in the development of this program and will be better determined as the program rolls out.

XII Evaluation of the Program

It would be beneficial to get some assistance early on so that curriculum mapping can be undertaken. Although this takes time, this mapping will clearly help link the educational outcomes to specific knowledge and skills and to assessment strategies. This will also enable the evaluation of the program early on.

XI Conclusion

In light of the clear requirement for curricular renewal at this time, this program will help meet the current societal need of addressing the optimization of drug therapy use by Ontario's citizens. It will enable our graduates to become increasingly responsible for patient care as an integrated member of the healthcare team, leading to a decrease in drug-related events and costs associated with them. This program will increase our partnership with clinicians from both pharmacy and other health care professions, and will make this an innovative and leading edge pharmacy program in Canada and internationally.

Appendix I

Curricular Renewal Process

A collaborative, inclusive process, under the leadership of Lalitha Raman-Wilms, has been undertaken in the development of a renewed program for all undergraduate students. Several *working groups* consisting of faculty members, students, recent graduates and practitioners have contributed to the development of the curriculum.

The groups include:

- Pharmaceutical Sciences
- Social & Administrative Pharmacy
- Pharmacy Practice
- Integrated Pharmacotherapy
- Experiential Training
- Cross-curricular Competencies
- Assessment & Evaluation

Work brought forward by these groups was reviewed by the *Curriculum Renewal Committee* consisting of faculty and students. The new curriculum was also brought forward to the Dean's *Decanal Committee* whose members include faculty, students, practitioners and representation from various professional associations (see below). All faculty are updated regularly through a website dedicated to this process and through regular information sessions. Once developed, the new curriculum will require approval from the Faculty Council, the University's Governing Council, and from the office of the Ontario Ministry of Training, Colleges and Universities.

Appendix II

The Assessment and Evaluation working group recommends the following modifications to the AFPC's Specific Educational outcomes for doctor of pharmacy graduates. Proposed changes to outcome elements is not included here.

Outcome Units

Outcome Unit 1 – Practice Pharmaceutical Care (revised by Assessment group)

The pharmacy graduate, in collaboration with patients and the inter-professional team, uses his/her knowledge and skills to achieve optimal patient outcomes by meeting patients' drug-related needs.

Outcome Unit 2 – Assume Legal, Ethical and Professional Responsibilities (revised by Assessment group)

The pharmacy graduate practices according to legal requirements, ethical and professional standards of practice, and fulfils professional responsibilities.

Outcome Unit 3 – Educate about Drug Use and Promote Health (revised by Assessment group)

The pharmacy graduate assumes responsibility to provide information and education on drugs, drug use, therapeutics, and health promotion to the public and health care providers in order to ensure optimal patient care.

Outcome Unit 4 – Coordinate Drug Distribution (revised by Assessment group)

The pharmacy graduate supervises and coordinates resources to ensure safe, accurate and cost-effective provision of medications and related products for patients' optimal care.

Outcome Unit 5 – Understand, Apply and Advance Practice-Management Principles (revised by Assessment group)

The pharmacy graduate applies and adapts practice-management principles to optimize patient care and use of practice resources.

Outcome Unit 6 – Apply Principles of Scientific Enquiry (revised by Assessment group)

The pharmacy graduate applies principles of scientific inquiry to contribute to health-related research*.

Appendix IV

Content areas to be covered in Pharmacy Practice courses

- Philosophy of practice
- Provision of Pharmaceutical Care (role of the pharmacist as a Caregiver and Decision-maker²¹)
- Patient care process (includes: Assessment of patient's drug therapy, Identification of drug therapy problems, Care plan development, Follow-up evaluation) (includes Medication History taking)
- Documentation systems (including electronic medical records)
- Educating patients and health care providers (including self-care) (role of the pharmacist as a Teacher)
- Communication (interpersonal, written, verbal) (role of the pharmacist as a Communicator)
- Legal and professional issues related to drug distribution and provision of patient care (includes jurisprudence)
- Drug distribution systems and processes
- Medication dispensing practices
- Pharmaceutical calculations
- Compounding of pharmaceuticals
- Patient safety considerations related to prescribing, transcribing, dispensing, administration and monitoring components of drug therapy
- Ethical issues related to drug distribution and patient care
- Professionalism
- Cultural competency
- Patient advocacy
- Collaboration and teamwork (integration/incorporation of IPE Curriculum currently being designed by the Office of Interprofessional Education, University of Toronto)
- Drug information
- Immunization
- Principles of Infection control
- Drug use and dependency
- Complementary and alternative therapy – foundations
- Nutrition
- Self- and peer assessment skills

²¹ World Health Organization, Developing Pharmacy Practice – a focus on patient care, Handbook - 2006 edition. The 'seven-star' pharmacist: Roles of pharmacist include Caregiver, Decision-maker, Communicator, Manager, Life-long learner, Teacher, Leader, Researcher (added in 2006).
http://www.who.int/medicines/publications/WHO_PSM_PAR_2006.5.pdf

Appendix V

COMMUNITIES OF PRACTICE MODEL FOR EXPERIENTIAL TRAINING

Introduction

Communities of practice (CoP) represent a model where those within a group engage in sharing and learning, based on common interests²². Within pharmacy education^{23,24}, this includes teaching, learning, and assessment that involves an entire group of individuals, both teachers and learners, at many different sites. The individuals within the sites and the sites together form a Community of Practice (CoP).

Some of the underlying concepts of teaching and learning within this model include the following:

- Within each community, students contribute meaningfully to the practice of the profession. This will mean that within pharmacy, we must find a way for students to develop meaningful, contributing roles in practice, rather than simply watch, shadow, be mentored or work under constant supervision.
- In the process of contributing, students learn to gradually accept more and more responsibility for their work, and learn in an incremental way to become independent practitioners.
- Within this model, the profession benefits from students – from their contribution to work, to new ideas and by creating an environment of enthusiasm, inquiry and discourse.
- Within the community, students will be taught and mentored by many individuals, including pharmacist-preceptors, senior students, pharmacy residents, fellows, and other health professionals.

The following are outlined below:

- CoP Structure
- Student Training within CoPs
- Integration within CoPs
- Resource Implications

²² Lesser EL, Storck J. Communities of Practice and Organizational Performance. IBM Systems Journal, Vol 40(4); 2001:831-841. <http://www.research.ibm.com/journal/sj/404/lesser.html>

²³ Duncan-Hewitt W, Austin Z. Pharmacy Schools as Expert Communities of Practice? A Proposal to Radically Restructure Pharmacy Education to Optimize Learning. *Am J Pharm Educ.* 2005;69(3) Article 54.

²⁴ Austin Z, Duncan-Hewitt W. Faculty, Student, and Practitioner Development within a Community of Practice. *Am J Pharm Educ.* 2005;69(3) Article 55.

CoP Structure

Each CoP will consist of pharmacists working in several sites and will include the following type of practice sites (at a minimum):

- A University of Toronto affiliated teaching institution or another teaching hospital which is willing to partner with the Leslie Dan Faculty of Pharmacy
- 3 to 4 other institutions, including community hospitals, specialty institution, etc.
- 20 community pharmacies, when feasible in close proximity to the other sites
- 10 primary care and other patient care sites (Family Health Teams-FHT, Community Health Centres-CHC, ambulatory clinics, etc.)
- One or more long-term care institution (a LTC may be affiliated with more than one CoPs)
- Community service agencies (part of the first year experiential program)
- Home care agencies, Community Care Access Centres (CCACs) (as some may employ pharmacists e.g., Toronto CCAC, or secure the services of consultant pharmacists)

The Leslie Dan Faculty of Pharmacy will facilitate the development of six Communities of Practice to train its undergraduate students in the professional pharmacy program.

Student Training within CoPs

Each CoP will make a commitment to train 40 students from each year of the professional pharmacy program. Students will be assigned to the same CoP throughout their program. In all, each CoP will oversee the training of 160 students – 40 students from each of the four years.

Students from each year will be expected to undertake specific responsibilities during their scheduled rotation. Activities will be dependent on the expectation for the student depending on their year of study in the pharmacy program and the type of site.

Senior students will be expected to ‘teach and coach’²⁵ junior students at the CoP.

Student learning in the following areas will take place at their assigned CoP:

- Early Experiential training (years 1 and 2 of program)
- Advanced Experiential training (years 3 and 4 of program)
- Pharmacy Practice Seminar (in year 4)

Also, if feasible, the following should be incorporated within the 4th year experiential component:

- Pharmacotherapy Advanced Case Discussions (in year 4)
- Applied Critical Appraisal (through Journal Clubs, Case Presentations, etc.) (in year 4; some expectation in years 2 and 3 as well)

²⁵ A clear indication of what is reasonable for senior students to teach needs to be determined. For senior students to be able to teach, they will be taught teaching skills within their pharmacy curriculum.

Appendix VI
NEW AND EMPHASIZED AREAS WITHIN A RENEWED CURRICULUM
 Leslie Dan Faculty of Pharmacy
 February 2008

Content / Skill / Activity	Renewed Curriculum	Current BScPhm Curriculum
	2 years of pre-pharmacy + 4 years in the pharmacy program	1 year pre-pharmacy + 4 years in the pharmacy program
Physical Chemistry, Organic Chemistry, Biochemistry, Statistics	To be required as pre-requisites	Currently taught in year 1 of the program
Anatomy, Physiology	To be taught together as a combined course for pharmacy students	Two separate courses, taught in conjunction with other health science students
Professional Practice courses	<p>All pharmacy practice courses will be streamlined, integrated and sequenced to enable students to gain the knowledge and skills required to provide pharmaceutical care.</p> <ul style="list-style-type: none"> • Time in practice lab increased significantly • Electronic documentation system in the labs (the same system will likely be in place at several practice sites so that the experience in the lab is authentic) <p>New and emphasized areas will include:</p> <ul style="list-style-type: none"> • Patient Safety • Health promotion activities • complementary medicine • enhanced communication skills • collaborative team-building skills • cross-cultural competency. • physical assessment of patients (with focus on effect of drug therapy) <p>Faculty development to be provided so that teaching and assessment of pharmaceutical care is consistent in all pharmacy practice courses.</p>	Currently these courses teach various components such as calculations, dispensing, jurisprudence, communication, and compounding, with little alignment or sequenced goals.

Content / Skill / Activity	Renewed Curriculum	Current BScPhm Curriculum
Pharmaceutical Science Courses	Integration of several areas will occur within these courses. A new course in Personalized Medicine will include content on Pharmacogenomics and changes in pharmacokinetics in different patient populations. Focus for these courses will be to enable students to apply the material in the context of patient care.	Courses structured in the traditional manner with no integration.
Immunology, Nutrition, Pharmacoepidemiology	These will be incorporated in the curriculum.	These are presently not covered.
Community Service Learning	Students will spend 3 hrs/week in year one, providing volunteer service at a health care organization.	
Electives	Students will have the opportunity to enhance their learning by selecting several electives: Year 2: up to 2 electives Year 3: up to 3 electives Year 4: 3 electives	Currently students take one elective during their program.
Integration of Biomedical Sciences, Pharmaceutical Sciences and Clinical Sciences.	Pharmacotherapeutics will be aligned and integrated with pharmacology, pathophysiology, clinical pharmacokinetics, clinical toxicology, critical appraisal, pharmacy informatics and relevant pharmaceuticals. These courses will be taught jointly by a basic scientist and a clinician. Students will be taught in smaller groups of 60.	Currently, these courses are taught separately and in many different years. Students are taught in a large class of 240. The courses are taught either by a basic scientist or a clinician.
Social and Administrative Courses	These courses will be closely integrated in how they are delivered and will also be closely linked with pharmacy practice courses and experiential training. The focus of providing direct patient care in practice will be emphasized in all courses.	Currently they are taught separately, with no specific links.
Herbal and Natural Health Products	This component will be added into various courses.	Currently this is an elective, with minimal inclusion of information in some courses.
Pharmacy Seminar Course	This will be delivered during the final year	

Content / Skill / Activity	Renewed Curriculum	Current BScPhm Curriculum
<p>Experiential Training – real life experiences in providing direct patient care, while working collaboratively within a team is essential in preparing our students for practice.</p>	<p>experiential rotations at various practice sites.</p> <p>This component will be expanded significantly in the new curriculum, with an emphasis on team-based care: Year 1: 4 weeks of training at a community or hospital pharmacy. Year 2: 1 day a week will be set aside for experiential learning. Year 3: 1 month Year 4: 9 months of training.</p>	<p>Year 1: 12 hours Year 2: 12 hours Year 3: none; proposal to implement a one-month training in 2010 Year 4: 4 months</p>
<p>Communities of Practice Model for delivery of Experiential programs</p>	<p>This model will be a new method of delivering this component of the program. The model is similar to Medical Academies where medical students obtain their training. Communities of Practices will be set up throughout the province, with regional coordination.</p>	<p>Currently, students in years 1 and 2 are sent to various sites, based on availability, within the GTA. Fourth year: practice rotations take place throughout the province. Currently, there is no specific coordination between these rotations and making arrangements for them is very labour intensive.</p>
<p>Interprofessional Education (IPE)</p>	<p>Students will have the opportunity to undertake IPE throughout the curriculum.</p>	<p>Students have the opportunity to undertake IPE in years 1 and 3.</p>

Appendix VII

Recommended content areas²⁶ within each core area:

Biomedical Sciences

Anatomy, biochemistry, immunology, microbiology, molecular and cell biology, physiology and pathophysiology.

Pharmaceutical Sciences

Medicinal Chemistry, pharmacology, toxicology, pharmaceuticals (encompassing the physical/chemical principles of dosage forms and drug delivery systems), biopharmaceuticals, pharmacokinetics and pharmaceutical biotechnology.

Behavioural, social and administrative pharmacy sciences

Biostatistics, epidemiology, health care economics, pharmacoeconomics, the profession of pharmacy, ethical and professional standards of practice, cultural diversity, healthcare systems, business and practice management.

Clinical Sciences

Pharmacokinetics, collaborative care with other health providers, complementary and alternative medicines, compounding, diagnostic and point-of-care testing, disease state management, dispensing and prescription processing, drug abuse and dependency, drug information including drug literature evaluation, drugs in pregnancy, emergency first care, evidence-based decision making, geriatrics, health promotion and disease prevention, immunization, information technology and practice support tools, medication administration, nutrition, pediatrics, patient assessment and outcomes monitoring, patient and professional communications, patient health information and documentation of care, pharmacy law and regulatory issues, pharmacotherapeutics, physical assessment, medication prescribing or therapy management by pharmacists, pharmacist's role in public health, medication and patient safety practices, and self care/non-prescription drug use.

Pharmacy Practice Experiences

These must include introductory and formative experiences and a sustained period of interaction with diverse patient populations in a variety of practice settings

Students must be able to contribute to patient care provided by interprofessional teams

Students' tasks at all stages must contribute meaningfully and productively to the professional activities of the site

Early and mid-program practice experiences: minimum 5 weeks (200 hours); may be supplemented with additional volunteer activities, service learning or other forms of community-based learning

Sustained period of required and elective concluding practice experiences: 36 weeks (1440 hours) of fulltime placement (must provide direct patient care)

²⁶ Excerpts taken from: The Canadian Council for Accreditation of Pharmacy Programs (CCAPP), Accreditation Standards and Guidelines for First Professional Degree in Pharmacy Programs, DRAFT October 5, 2007.

APPENDIX VIII DISCUSSIONS WITH STAKEHOLDERS

The following discussion forums/presentations have taken place with various stakeholders in relation to the new curriculum:

Group	Date
CPhA – Moving Forward Seminar	March 2007
AFPC annual conference Presentation	May 2007
Fourth year Undergraduate Pharmacy Student Orientation	September 2007
Directors of Hospital Pharmacies in Ontario	November 2007
CSHP Ontario Branch Meeting Presentation	November 2007
Pharmacy Students – years 1 to 4	January 2008
CAPSI session – ELPD – Pharmacy students years 1-4	March 2008
Community and Hospital Practitioners	April 2008