

**ASSOCIATION OF FACULTIES OF PHARMACY OF CANADA**

**EDUCATIONAL OUTCOMES**

**FOR A**

**POST-BACCALAUREATE DOCTOR OF PHARMACY GRADUATE IN CANADA**

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## INTRODUCTION

The educational outcomes for a post-baccalaureate Doctor of Pharmacy (Pharm.D.) graduate were based on those developed for Baccalaureate (B.Sc.) degree graduates. Hence, the Background and Introduction sections in the B.Sc. Outcomes document should be reviewed, as the principles outlined are equally relevant to the Pharm.D. Outcomes. The outcomes for B.Sc. graduates concerned with Managing Drug Distribution (#5), and Understanding Practice Management Principles (#6) were not seen as areas of emphasis within a Pharm.D. program, and hence have been deleted. While the outcome Assume Legal, Ethical and Professional Responsibilities (#2) is, in general, appropriate for a Pharm.D. graduate, the Outcome has been significantly modified. The remaining outcomes are very similar, and in most cases identical to those for the B.Sc. graduate. However, the outcomes do differ in the level at which the graduates from the two programs are expected to be able to perform a given task.

The following framework<sup>1</sup> was used to define the expected level of performance for a Pharm.D. graduate at an expected level of competence for each Outcome Unit. According to this framework, a level of competence is defined by two parameters, one is the Level of Difficulty of the task and the second is the student's proficiency in performing the task.

Level of Difficulty of the task - Difficulty can be defined by the amount and complexity of knowledge required and the complexity inherent to the specific situation in which the application occurs. The complexity of knowledge and complexity of application can be low or high creating three Levels of Difficulty (Level I, Level II and Level III) as illustrated in the following Table.

Table I - Level of Difficulty of the task		Complexity of <i>application</i> required for the task	
		Low	High
Complexity of <i>knowledge</i> required for the task	Low	Level I	Level II
	High	Level II	Level III

Proficiency - At each Level of Difficulty (I, II and III) a student can perform at four sequential levels of proficiency, starting with the “Initial” level and progressing through “Developing”, “Intermediate”, and ending at the “Advanced” level. These proficiency levels are defined as follows:

é **Initial** - the student is *introduced* to the knowledge and skills that are required for the assigned task at the assigned Level of Difficulty

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<sup>1</sup> Developed by Jana Bajcar, Director, Pharm.D. Program, Faculty of Pharmacy, and Cleo Boyd, Director, Academic Skills Centre, Mississauga Campus, University of Toronto based on Biggs, J and Collis, K, "Towards a Model of School-based Curriculum Development and Assessment Using the SOLO Taxonomy", Aust.J.Ed. 33 (1989) 151-163.

- é **Developing** - the student *gains understanding* of the knowledge and skills, and learns to *integrate* the knowledge and skills for the assigned task at the assigned Level of Difficulty
- é **Intermediate** - the student is able to *apply* the knowledge and skills in *familiar situations* for the assigned task at the assigned Level of Difficulty
- é **Advanced** - the student can use the knowledge and skills attained in the previous levels in *familiar and unfamiliar situations* for the assigned task at the assigned Level of Difficulty; this is a transition level of proficiency where the student is ready to move to the next Level of Difficulty.

The following Table illustrates the conceptual framework for defining levels of competence.

Table II - Conceptual framework for defining levels of competence		Complexity of <i>application</i> required for the task	
		Low	High
Complexity of <i>knowledge</i> required for the task	Low	<b>Level I</b> a) Initial b) Developing c) Intermediate d) Advanced	<b>Level II</b> a) Initial b) Developing c) Intermediate d) Advanced
	High	<b>Level II</b> a) Initial b) Developing c) Intermediate d) Advanced	<b>Level III</b> a) Initial b) Developing c) Intermediate d) Advanced

The framework requires that each Outcome Unit be first defined by the Level of Difficulty of the task (I, II or III) and then by a specific proficiency (Initial, Developing, Intermediate or Advanced). At the beginning of each outcome for a Pharm.D. graduate the expected Level of Difficulty and the proficiency for the outcome are indicated according to the framework, and examples are provided to illustrate the degree of difficulty.

Finally, in the B.Sc. Outcomes document, preceding the outcomes are the "General Outcomes Required of a University Graduate and Educated Citizen and Necessary for the Fulfilment of the Professional Outcomes Required of Pharmacy Graduates". They are needed to meet practice, professional and societal responsibilities, and they refer to those ability-based outcomes desired from a University education and essential for professionals. These general attributes have been included in the Glossary of this document.

It is expected that the outcomes in this document will be met by students at the time of graduation from post-B.Sc. Pharm.D. programs.

## **Outcome #1**

### **Meet Patients' Drug-Related Needs**

Outcome Unit:

Pharm.D. graduates, in partnership with patients and other health care providers, use their knowledge and skills to meet patients' drug-related needs, with the objective of achieving optimal patient outcomes and maintaining or improving the patients' quality of life.

Expected Level of Achievement<sup>1</sup>: A Pharm.D. graduate must demonstrate competence with tasks at a Level of Difficulty III and a Developing level of proficiency.

Highly complex knowledge for this outcome includes use of medications with narrow therapeutic indices, the number of drug-related problems and diseases, the complexity of the disease state, the complexity of the patient specific information, the presence of contraindications, the complexity of the technology for the delivery of the drug, barriers to drug delivery, complexity of relevant literature, inadequate patient and drug information, and ethical/legal issues as they relate to the indication for use of the drug, the patient and resource related issues.

Application at a high level of complexity for this outcome includes dealing with a patient in which one or more of socioeconomic class, communication skills, cultural background and health beliefs, and education or knowledge base is different from that of the graduates. Also, age may contribute to the complexity of the patient, as would pathophysiology of the disease, mental status/decision making ability of the patient, ethical/legal issues as they relate to the indicated use of the drug, the patient and use of resources, the number of health care professionals involved in a patient's care, and drug access problems.

The abilities that would be important for a Pharm.D. graduate to meet this outcome are knowledge and thinking, planning, communication, responsible use of values and ethical principles, and self-directed learning.

Outcome Elements:

- 1.1 Develop a professional<sup>2</sup> relationship with the patient and/or the patient's care provider<sup>3</sup> that conforms to the applicable Codes of Ethics of the profession
  - i. establish and maintain a rapport with the patient by using effective dialogue
  - ii. demonstrate a caring, empathetic, and professional attitude
  - iii. determine, in conjunction with the patient, the responsibilities of the pharmacist and the patient, the benefits of acceptance of these responsibilities and the consequences

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<sup>1</sup> The conceptual framework defining the expected level of difficulty and level of proficiency within each level of difficulty is discussed in the Introduction.

<sup>2</sup> A relationship in which the patient and the pharmacist establish a framework for decision making based on the patient's values. There are obligations and expected benefits for both the health care provider and the patient.

<sup>3</sup> In the remainder of this document, patient means patient and/or the patient's care provider.

of not accepting these responsibilities

- 1.2 Determine the patient's needs and desired outcomes of drug therapy
  - i. use a variety of information sources to elicit the patient's values, desired level of care, health concerns, scope and breadth of health problems and facilitators and impediments to health
  - ii. establish a professional contact with the patient's other health care providers in order to gather related health and drug information
  - iii. assess the accuracy, relevance and impact of the above information
  - iv. in conjunction with the patient determine reasonable, feasible and desired health-related outcomes
  - iv. prioritize the desired outcomes
- 1.3 Identify and prioritize the patient's actual and potential drug-related problems (see Glossary for types of drug-related problems)
  - i. use a variety of data sources to collect the information required to identify the patient's drug-related problems
  - ii. identify the drug-related problems
  - iii. prioritize the drug-related problems
- 1.4 Develop therapeutic and monitoring plans desired to achieve optimum patient outcomes and to resolve/prevent the patient's drug-related problems
  - i. assess the alternative strategies (including no treatment, non-drug treatment, non-prescription and prescription drugs) and select the therapeutic option best suited to the patient in consultation with the patient and, when appropriate, other health care providers
  - ii. make a recommendation, explaining the rationale for the treatment options and outlining the advantages and disadvantages of the alternatives
  - iii. assume responsibility for the recommendation
  - iv. determine the desired therapeutic endpoints
  - v. identify appropriate monitoring parameters
  - vi. formulate a monitoring plan
  - vii. determine the responsibilities of the pharmacist, the patient and other health care providers
- 1.5 Refer as required
  - i. determine if a referral is necessary
  - ii. identify the appropriate health care provider or agency for the referral
- 1.6 Implement the therapeutic and monitoring plans to assess the progress of the patient in order to evaluate the outcomes
  - i. establish a mechanism for follow-up
  - ii. implement the plans
- 1.7 Revise the patient's list of drug-related problems, the prioritization, and the therapeutic and monitoring plans when appropriate
  - i. interpret the relevant information collected as determined in the monitoring plan
  - ii. evaluate the success of the therapeutic and monitoring plans relative to the desired patient outcomes
  - iii. refine or revise the plans as necessary
  - iv. provide ongoing care, education and counselling
  - v. obtain feedback on the quality of the care process
  - vi. undertake required communication with other health care providers

- 1.8 Document patient information, desired outcomes, drug-related problems, assessment, referrals, recommendations, interventions, follow-up and outcomes
- i. identify the objectives of the documentation
  - ii. maintain the medication profile, medical history and patient information
  - iii. document the required patient-specific information and care provided
  - iv. document communication with other health care providers and health/social agencies
  - v. document communication with third party payers

## **Outcome #2**

### **Assess Legal, Ethical and Professional Obligations**

Outcome Unit:

Pharm.D. graduates will be able to contribute to the development of legal, ethical and professional standards
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Expected Level of Achievement: A Pharm.D. graduate must demonstrate competence with tasks at a Level of Difficulty III and an Initial level of proficiency.

Graduates are expected to be able to apply legal and ethical principles to a given clinical situation in which legal, ethical and professional issues are overlapping and/or conflicting.

Complexity in knowledge requires a comprehensive understanding of the major ethical frameworks and legal and professional obligations and how these frameworks and obligations relate to each other.

Complexity in application requires a situation in which these frameworks and/or obligations conflict. For example, this level of complexity exists when a situation arises in which a conflict occurs between societal and professional requirements or expectations and those of the patient.

The abilities that would be important for a Pharm.D. graduate to meet this outcome include knowledge and thinking, communication, responsible use of values and ethical principles, self-directed learning, professional identity and citizenship.

Outcome Elements:

- 2.1 Relate theoretical ethical frameworks to legal and professional obligations
- 2.2 Be able to mediate conflict among legal, ethical and professional dilemmas
- 2.3 Predict emerging roles for the profession within the health care system



### **Outcome #3**

#### **Provide Drug and Drug Use Information and Recommendations**

Outcome Unit:

Pharm.D. graduates provide information and recommendations to individuals and groups concerning drugs and drug use to ensure optimum and cost effective patient care and to promote health.

Expected Level of Achievement: A Pharm.D. graduate must demonstrate competence with tasks at a Level of Difficulty III and a Developing level of proficiency.

Graduates would be expected to provide information and recommendations to the public, other pharmacists and other health professionals.

Knowledge at a high level of complexity for this outcome include information and recommendations where there is a high degree of controversy, little data is available, the quality of data is poor, there is a high degree of decision making, and/or a high degree of integration of information is required.

Complex application is where the audience is one in which the ability to read verbal and non-verbal cues must be advanced, e.g. issues of cross-cultural audiences, cross-disciplinary audiences or non receptive audiences (lack motivation or ability, have fear or apprehension, have different beliefs).

The abilities that would be required for a Pharm.D. graduate to meet this outcome are knowledge and thinking, communication, and self-directed learning.

Outcome Elements:

- 3.1 Identify needs for information and recommendations on drugs and drug use
- 3.2 Respond to these needs with consideration to the principles of pharmacoepidemiology, pharmacoeconomics and pharmacotherapeutics
  - i. use the necessary retrieval techniques to access the required drug-related information
  - ii. critically analyze the information (consider adequacy of research design, statistical testing, relevance, applicability, accuracy, reliability, validity and generalizability)
  - iii. organize information for a variety of audiences, determining critical content, formulate recommendations as relevant, and use appropriate methods for dissemination/communication
  - iv. evaluate the usefulness of the information provided
  - v. document the information provided

## **Outcome #4**

### **Educate About Drugs, Drug Use and Health Promotion**

Outcome Unit:

Pharm.D. graduates educate individuals and groups to encourage appropriate drug use and to promote health.

Expected Level of Achievement: A Pharm.D. graduate must demonstrate competence with tasks at a Level of Difficulty III and a Developing level of proficiency.

Graduates would be expected to provide education and health promotion to the public, other pharmacists, other health professionals, and health professional students.

Information and recommendations would be complex when there is a high degree of controversy, little data is available, the quality of data is poor, there is a high degree of decision making, and/or a high degree of integration of information is required.

Complex application would occur when the audience is one in which verbal and non-verbal communication must be sophisticated, e.g. issues of cross-cultural audiences, cross-disciplinary audiences or non receptive audiences (lack motivation or ability, have fear or apprehension).

The abilities that would be required for a Pharm.D. graduate to meet this outcome are knowledge and thinking, planning, communication, responsible use of values and ethical principles, self-directed learning, professional identity and citizenship.

Outcome Elements:

- 4.1 Identify needs of individuals and groups for education related to drugs, drug use or health promotion
  - i. identify barriers to and facilitators of health and wellness in individuals and groups
- 4.2 Design, implement and evaluate a plan for an educational event related to drugs, drug use or health promotion
  - i. identify learning needs
  - ii. collaborate with patients and other health care providers in the development of strategies
  - iii. assess personal abilities to carry out a particular plan
  - iv. select instructional techniques appropriate for the learner(s)
  - v. select and organize content
  - vi. implement the educational plan
  - vii. assess outcomes

## **Outcome #5**

### **Apply the Principles of Scientific Inquiry to Contribute to the Profession and Society**

Outcome Unit:

Pharm.D. graduates will apply the principles of scientific inquiry to address pharmacy practice problems.

Expected Level of Achievement: A Pharm.D. graduate must demonstrate competence with tasks at a Level of Difficulty I and an Intermediate level of proficiency.

This would require the student to understand basic research design, contribute to the overall research protocol, be independently responsible for a small component of a larger research project, collect accessible information, apply statistical methods to the data and arrive at a conclusion.

The abilities important for a Pharm.D. graduate to meet this outcome are knowledge and thinking, planning, communication, responsible use of values and ethical principles, and self-directed learning.

Outcome Elements:

- 5.1 Apply the principles of scientific inquiry to study pharmacy practice issues
  - i. recognize relevant problems and opportunities
  - ii. define the parameters of the problem or opportunity
  - iii. retrieve and assess reports/literature relevant to the problem or opportunity
  - iv. formulate research questions/hypotheses
  - v. establish/develop protocols
  - vi. participate in implementing the protocols
  - vii. participate in collecting, analyzing and interpreting data
- 5.2 Use the results of research projects and literature to propose changes in pharmacy practice
  - i. understand the process of making change and the normal human reaction to this process
  - ii. identify changes indicated by research results
  - iii. determine the changes most appropriate for practice, specifying intended results
  - iv. identify by whom and under whose authority change should be implemented
  - v. plan for obtaining approvals as necessary for these proposals, including the time lines, resource requirements, consultation with stakeholders, education and training of stakeholders in the change process and methods for monitoring of outcomes
  - vi. participate in implementing the proposals and monitoring the implementation process including collection of any data concerning outcome measures
  - vii. assess the outcome data and interpret the results
- 5.3 Understand and adhere to ethical research principles
  - i. identify the relevant ethical issues related to research
  - ii. identify the relevant issues which apply to the project
  - iii. indicate how the relevant issues would be addressed and approvals sought
- 5.4 Prepare and defend a research plan
  - i. prepare a report of the research plan in a format which complies with the

- ii. expectations of the scientific method  
present the research plan

## **GLOSSARY OF TERMS**

### **Abilities**

1. Knowledge and Thinking Abilities - Graduates shall have knowledge and comprehension of the core information associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and pharmacy practice<sup>4</sup>. They will be able to utilize the principles of scientific inquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. They will be able to systematically find, analyze, evaluate and apply information and shall make informed, defensible decisions.
2. Planning Abilities - Graduates will be able to demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. They will be able to develop and implement plans and organize work to meet deadlines. Planning and implementing change are important within this ability and require graduates to understand and consider the human reaction to change, motivation issues, leadership and team building when planning changes required for fulfilment of practice, professional and societal responsibilities.
3. Communication Abilities - Graduates will be able to effectively use and respond to written, verbal and nonverbal communications from diverse audiences and for varied purposes. To do so, graduates must be able to use information, media and technology. Graduates will have a sufficient understanding of information systems to integrate computer and related technology into their daily practice.
4. Values and Ethical Principles - Graduates will honour personal values and apply ethical principles in professional and social contexts. They will be able to demonstrate behaviour that recognizes cultural and personal variability in values, communication and life styles. They will be able to use ethical frameworks and apply ethical principles when decision-making. They will take responsibility for the outcomes associated with their decisions.
5. Self-directed Learning Abilities - Graduates will be able to demonstrate self-directed learning capabilities as a means of fulfilling and advancing their practice and professional role in society. They will be able to effectively self-assess and use feedback from others to identify their learning needs and to satisfy these needs on an ongoing basis.
6. Professional Identity - Graduates will be able to understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, suppliers of pharmaceuticals, promoters of health, educators, business managers, employers, employees) through consideration of historical, social, economic and political issues. They will be able to evaluate these factors, and the conflicts they may create, when integrating these roles. They will be able to demonstrate attitudes and behaviours which reflect a pride in and a desire to improve the profession, including a commitment to the profession's responsibility to teach future pharmacists.
7. Citizenship - Graduates will be able to assume participatory or leadership roles when appropriate to facilitate improvement in health and well being. This requires graduates to be informed, responsible citizens.

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<sup>4</sup> Based on content areas specified in the Canadian Council for Accreditation of Pharmacy Programs Standards, Standard No. 11, 1997.

**Biomedical Sciences**

? content in anatomy, biochemistry, biostatistics, immunology, microbiology, molecular biology, physiology and pathophysiology (from CCAPP, 1997)

**Drug-related problem**

- ? undesirable signs or symptoms which result when a patient:
  - ? is taking/receiving a drug for no medically valid indication
  - ? needs pharmacotherapy but is not receiving it
  - ? is taking/receiving the wrong drug
  - ? is taking/receiving too little of the right drug
  - ? is taking/receiving too much of the right drug
  - ? is taking/receiving the drug inappropriately
  - ? is experiencing an adverse drug reaction
  - ? is experiencing a drug interaction

**Pharmaceutical sciences**

? content in medicinal chemistry, pharmacology, toxicology and pharmaceutics (physical/chemical principles of dosage forms and drug delivery systems, biopharmaceutics and pharmacokinetics) and behavioral, social and administrative pharmacy (epidemiology, health care economics, pharmacoeconomics, practice management, history of pharmacy, ethical foundations of practice, and social and behavioral applications (combined behavioral, social and administrative sciences with pharmaceutical sciences from CCAPP, 1997)

**Pharmacy practice**

? content in clinical laboratory medicine, clinical pharmacokinetics, communications applicable to pharmacy, complementary and alternative medicines, computer applications, delegated prescribing authority, disease-state management, drug distribution and drug administration, drug information and literature evaluation, emergency first-care, geriatrics, gerontology, health promotion and disease prevention, laws pertaining to practice, nutrition, outcomes documentation, paediatrics, patient evaluation, pharmacotherapeutics, physical assessment, prescription processing (from CCAPP, 1997)

**Outcome**

- ? Pharm.D. graduate context - what a graduate should be able to do with what they have learned
- ? patient context - desired therapeutic outcome

**Outcome unit**

- ? a general description of the outcome that includes the key indicators of the expected outcome

**Outcome element**

- ? a subsection of the outcome unit indicating the parts that are needed to accomplish the whole

**Standard of practice**

- ? standards of practice are those standards of practice required by the licensing bodies in each province