

**Innovative training program for pharmacists in the Second Xiangya Hospital of Central South University**

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ABSTRACT

Pharmacists are one of the most accessible health care providers in many parts of the world, including China. To better prepare pharmacists to provide pharmaceutical care and comprehensive care, often they are sent to train in a developed countries such as Canada. Because the health care systems are completely different between the countries, most of the pharmacists have difficulties applying their newly acquired skills and knowledge to their own health care. As a result, the Second Xiangya Hospital of Central South University agreed to second a Faculty Member/pharmacist for 8 months. The Faculty member will be at the Second Xiangya Hospital of Central South University to implement a pharmacy clinical program and a structured training program for pharmacists.

Keywords: Pharmacist, Health, China

INTRODUCTION

Since late 1970, the health care system began to improve for the citizens in China.¹ In 2013, the total population in mainland China was 1.354 billion people and over 200 million people (15%) are 65 years and older.² To address the disparity between the health care system between the urban and rural communities, China introduced a health care reform plan in 2009.³ The aim is to provide affordable, equitable and accessible health care to all citizens.⁴ Since community pharmacists are one of the most accessible health care providers in many parts of the world, pharmacists were identified as having a pivotal role to ensure all people in China have easy access to health services. Policies were put in place to implement pharmacy and therapeutics committees and increase employment of clinical pharmacists to

provide pharmaceutical care.⁵ Many hospitals in China are currently sending pharmacists to hospitals or universities in North America to gain clinical experience and knowledge from trained clinical pharmacists in North America, in hopes these pharmacists would be able to provide pharmaceutical care and conduct clinical research. The Second Xiangya Hospital of Central South University is one of the top tertiary hospitals located in Changsha, Hunan. It consists of 3500 beds and serves on average 98,000 inpatients and over 2 million outpatients a year. One of the unique features about the teaching hospitals in China is the connection to the Universities. Among 3000 plus health care professionals, the Second Xiangya Hospital has over 580 Full or Associate Professors with a cross appointment or teaching commitment with the Central South University.

Like all leading tertiary hospitals, The Second Xiangya Hospital of Central South University, Changsha, Hunan, pursues opportunities to implement a clinical pharmacy service to provide pharmaceutical care. Currently the pharmacy dispenses about 8000 prescriptions for outpatients and more than 4000 prescriptions for inpatients in the hospital each day. There are 102 pharmacists, 11 clinical pharmacists and 26 pharmacy technicians in the department of pharmacy. The clinical pharmacists currently attend multidisciplinary rounds, checking medication records, providing consultation, medication education, and therapeutic drug monitoring. In addition, they teach pharmacy students and young pharmacists in training from other hospitals. Almost all of the pharmacists graduated from the Central South University. Most of the clinical pharmacists have a PhD degree in Pharmacology or Pharmaceutical Sciences. Hence, these pharmacists continue to conduct bench research. At the invitation of Dr. Löbenberg of the University of Alberta, Canada, Professor Xiang of the Second Xiangya Hospital visited Alberta to collaborate on the research of traditional Chinese medical compounds. Whilst in Edmonton, Dr. Löbenberg introduced Professor Xiang to Dr. Hoan Linh Banh, a Doctor of Pharmacy and Associate Professor in the Department of Family Medicine at the University of Alberta. Dr. Banh has experience in assisting to establish a Pharmacy curriculum at Dalhousie University, College of Pharmacy in Halifax, Nova Scotia and University of Alberta, Faculty of Pharmacy and Pharmaceutical Sciences. Also, she was the coordinator for the Queen Elizabeth II Health Sciences Centre (QEIIHSC) and Dalhousie University, College of Pharmacy residency program for three years and the clinical coordinator for the Intensive Care Unit at the QEIIHSC. Several research opportunities have resulted from this connection and in particular an opportunity to collaborate on educational initiatives.

As a result, The Second Xiangya Hospital of Central South University initiated collaboration with the University of Alberta to assist them in implementing a clinical pharmacy program and a structured pharmacists training program.

Initial Step: The director of pharmacy, Professor Xiang from the Second Xiangya Hospital of Central South University (SXH) invited Dr. Banh, for an onsite visit to assess their existing clinical program in the department of pharmacy. During the visit at SXH in December 2013, she attended rounds with the clinical pharmacists in ICU, CVICU and the respiratory ward.

Assessment of the current clinical program: The medical team at the hospital is very receptive to having pharmacists attending medical rounds. Physicians are very approachable with any therapeutics suggestions. However, most of clinical pharmacists have difficulties identifying drug related problems. This is perhaps due to the limited clinical exposure of their pharmacy education and training.

Pharmacy curriculum: The current pharmacy program is a four-year program. Although, the program is competitive to enter, no pre-requisite is required for the admission to the pharmacy program. The curriculum consists mostly of basic science, pharmaceutical sciences, and pharmacology courses. Table 1 is a summary of the curriculum at Central South University. The program is currently deficient in therapeutics courses and lacks experiential education to fully prepare the students to provide pharmaceutical care to patients.

EDUCATIONAL ENVIRONMENT

Strengths: The department is equipped with adequate pharmacists and pharmacy technicians to efficiently operate the pharmacy. Most importantly, the clinical pharmacists have a very positive attitude and willingness to learn to provide pharmaceutical care to patients.

Limitation: Currently, there is an expectation from the hospital for the clinical pharmacists to perform bench research. This limits the amount of time these pharmacists have to learn clinical patient care research.

PLAN

Often, in China, health care professionals are sent to train in developed countries such as Canada or the US. These individuals are trained under a health care system that is completely different from the one in their own country. As a result, most of these individuals have difficulties applying their newly acquired skills and knowledge to their own health care system.

To prepare the pharmacists to provide pharmaceutical care and clinical research, the SXH agreed to support 8 months of a Dr. Banh's time from the University of Alberta. This time would be spread out over three years, enabling the faculty member to go to Changsha to implement a clinical pharmacy program and structured pharmacists training program and follow-up as it develops. The faculty member will be at SXH and the Central South University (CSU) for

three months for the first 2 years and two months in the third year. To the best of our knowledge, this is the first agreement of its kind to send a foreign faculty member/health care professional to China for this long period of time to teach and train pharmacists.

By spreading out the training over three years, it allows the pharmacists in China time to carry out the tasks and to practice their new skills once they are prepared and also to identify any learning issues in the interim. At the same time, this enables Dr. Banh to return to Canada and carry out her academic duties while providing support to the pharmacists in China through electronic communications.

Expected Outcomes and Learning Objectives: The first step in the process of program development is to assess the clinical pharmacists' baseline clinical skills and knowledge. A survey will be given to all pharmacists at SXH identifying the group's strengths and weaknesses and performing learning needs assessment. In addition, the pharmacists are to identify what they believe should be the expectations of a clinical pharmacist. A separate survey will be given to patients identifying their expectations from pharmacists.

Before the education program starts, the pharmacists will be given a pre-test of their individual clinical knowledge, skills and understanding of pharmaceutical care. A series of structured therapeutic lectures on topics such as cardiology, pulmonology, endocrinology, infectious diseases and principles of pharmaceutical care will be provided to the pharmacists. After the lectures, the pharmacists will be required to take a post-test to determine what they have learned. In a coordinated effort with the

clinical leader, Xu Ping, each clinical pharmacist will be trained to provide pharmaceutical care and comprehensive care to all patients in the selected clinical areas. These clinical pharmacists will serve as preceptors for the future training program thus ensuring sustainability of the program after the three-year implementation.

In addition, 'rotations' or 'periods of practice in a variety of situations will be identified for the training program. For example, these might be 'rotation' of four weeks in the ICU or six weeks in the outpatient department. The student will 'rotate' through each of these situations for experience. Learning objectives for each rotation and evaluation tools will be developed to guide the clinical pharmacists in the training process.

At the completion of the program implementation, a satisfaction survey will be sent to all of the members of the interdisciplinary team such as the physicians, medical residents and nurses and patients to determine if the impact of the new role of the pharmacist on the other clinicians.

As for research, the clinical pharmacists will be trained to conduct clinical research in diabetes, renal disease, hypertension, heart disease and infectious diseases. The studies will also provide a learning opportunity for the pharmacists to publish in peer review journals.

At the end of the third year, the hospital will have a structured training program to train pharmacists to provide pharmaceutical care and clinical research.

Conflict of interest: All authors have no conflict of interest to declare.

Table 1. Pharmacy curriculum at Central South University

Year	Curriculum
Year 1, Semester 1	Basic English, Inorganic Chemistry, Inorganic Chemistry Experiment, University Physics, Physics Experiment, Computer Fundamental, Calculus, Computer Practice, Resource Assessment
Year 1, Semester 2	Basic English, Organic Chemistry, Physical Chemistry, Physical Chemistry Experiment, Probability and Statistics, Analytical Chemistry, Analytical Chemistry Experiment, Mental Health Education, Company Management Strategy, Calculus, Linear Algebra
Year 2, Semester 1	Physiology, Biochemistry, Human Anatomy, Basic English, Organic Chemistry, Organic Chemistry Experiment, Medical English Writing, Common Chemicals and Human Health, Microbiology, Information Retrieval, Introduction of Pharmacy Discipline
Year 2, Semester 2	Instrumental Analysis, Instrumental Analysis Experiment, Pharmaceutical Botany, Pharmacognosy, Techniques of Molecular Biology, Ornamental Botany, Molecular Biology, Medical Research and Design, Spectrum Analysis

Year 3, Semester 1	Natural Medicinal Chemistry, Pharmacology, Medicinal Chemistry, Basic skills of Reading Medical literature in English, Basic Academic Communication in English, Pharmacy Administration, Drug Toxicology
Year 3, Semester 2	Drug Analysis, Bioorganic Chemistry, Biopharmaceutics and Pharmacokinetics, Therapeutics, General Clinical Pharmacy, Pharmacy
Year 4, Semester 1	Systematic Clinical Pharmacy, Drug Information, Pharmacy, Hospital Pharmacy Practice (for students majoring in Clinical Pharmacy), Pharmaceutical comprehensive skills training I (for students majoring in Medicinal Chemistry and Natural Medicinal Chemistry), Pharmaceutical comprehensive skills training II (for students majoring in Pharmacy and Pharmaceutical Analysis)
Year 4, Semester 2	Graduation Practice (including graduation thesis and defense), beginning from Semester 1 of Year 4

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