

# Discussion on the mode of standardized training and teaching for clinical pharmacists

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**Abstract:** Clinical pharmacists play a subjective role in clinical pharmacy. In order to explore an effective training model for clinical pharmacists, this paper provides a reference for clinical pharmacy work. Starting from the standardized training and teaching mode of clinical pharmacists, the paper discusses the training mode, objectives, standards, methods and implementation strategies. Combined with teaching practice, the paper summarizes the relevant advantages of the standardized training and teaching mode of clinical pharmacists, and finally draws the experience and experience of the standardized training and teaching mode of clinical pharmacists, aiming to provide support for the research on the standardized training and teaching mode of clinical pharmacists.

**Keywords:** Clinical pharmacist; Standardized training; Teaching mode

## 1. Introduction

Since 2006, one-year standardized training of clinical pharmacists has begun, which has played a vital role in promoting the training and construction of clinical pharmacists in our country. However, so far, the standardized training of clinical pharmacists has only clarified the relevant training objectives and contents in the teaching syllabus, but has not given a clear explanation and regulation for the specific implementation strategy, that is, the teaching mode [1]. Therefore, some pharmacy teachers shoulder the heavy responsibility of the backbone of the hospital pharmacist team, because the daily work is heavy, can not ensure enough teaching time and quality. Due to the many training tasks of students, most of the teaching pharmacists do not allow students to participate in the work process, but only take charge of theoretical guidance. Therefore, students are just a bystander in most of the actual operation process and do not get enough opportunities for clinical pharmacy practice [2]. Moreover, in recent years, the source of clinical pharmacist training students has slowly developed to the grass-roots level, and the educational background and self-learning level of students have been continuously reduced, and the students have become more confused in the training and learning process. This paper studies the specific process and advantages of the standardized training and teaching mode of clinical pharmacists, hoping to find a feasible and feasible standardized training and teaching mode that can combine the teaching work with clinical practice.

## 2. Training mode and objectives

Under the guidance of the Expert Committee of Clinical pharmacists work of Chinese Hospital Association, clinical pharmacists training in China is on-the-job training, which mainly takes clinical pharmacy practice as the main content and theoretical teaching as the assistance, and carries out full-time training. Different specialties provide classified guidance, and clinical pharmacists and clinicians form a joint teaching group, each group is composed of 2-3 students. In the process of teaching and training, we make full use of academic activities carried out by other majors, and combine the characteristics of each professional training to provide students with diversified learning methods. In addition, combining clinical pharmacist training and ADR monitoring to strengthen students' ability and level in drug monitoring constitutes the teaching feature of clinical pharmacist training. The training practice of clinical pharmacist students is 1 year, and the training time of teacher students is 8 weeks of intensive training on the basis of 1 year clinical pharmacist training. In addition to the difference in training cycle, the training objectives formulated by clinical pharmacists and teacher trainees are also different. The training purpose of clinical pharmacists is to master basic professional

knowledge and practical skills, participate in clinical drug therapy, and complete tasks independently [3]. The purpose of teacher training is to enable students to master the standard teaching methods, master the professional level and ability of students.

### **3. Training standards**

#### ***3.1. Comprehensive quality***

Clinical pharmacists need to master the relevant provisions of the Prescription Management Measures (Trial), the Guiding Principles for Clinical Application of Antibiotics and other documents; Have a strong professional responsibility, good psychological quality, correct professional ethics and legal concept, to protect patients' rational drug use rights, respect patients.

#### ***3.2. Clinical knowledge and skills***

Clinical pharmacists need to master the pathogenesis and diagnosis methods of major diseases in the training specialty, understand the criteria and basis for diagnosis and treatment of diseases related to the training specialty, have the ability to know and understand the cases of the training specialty, understand the significance of medical tests and inspection reports related to the training specialty in clinical diagnosis, and can independently write the medicine power of the training specialty.

#### ***3.3. Drug knowledge and drug practice skills***

Clinical pharmacists need to understand the principles of drug use and efficacy evaluation of the training specialty, understand the pharmacodynamic knowledge and pharmacokinetic knowledge of the commonly used diagnostic drugs in the training specialty, master the effects, adverse reactions, indications and precautions of more than 50 commonly used diagnostic drugs, judge and select drugs according to the condition, and participate in the design, discussion and evaluation of clinical drug programs in the training specialty, be able to detect and resolve possible drug problems in a timely manner.

#### ***3.4. Communication skills***

After the training, clinical pharmacists can effectively communicate with doctors and patients, and clearly state their own clinical medication problems in the process of participating in clinical ward rounds and medical record discussions, and give suggestions and solutions to relevant medical staff; Clinical pharmacists can actively and timely grasp the problems of medical staff and patients in clinical drug information, and can provide accurate clinical drug information. Clinical pharmacists can instruct patients on the proper use of drugs.

#### ***3.5. Clinical drug research skills***

After the training, clinical pharmacists can use computers to search domestic and foreign clinical pharmaceutical information online, read and analyze clinical drug therapy related literature, and have a basic understanding of the content and methods of clinical drug research in the training specialty.

### **4. Training methods and implementation**

#### ***4.1. Clinical pharmacist students***

Based on the learning characteristics and training objectives of clinical pharmacists, the training program was designed. Based on the introduction of the training objectives, training methods and the setting of training indicators, the training was conducted on how to use clinical pharmacy workstations to obtain clinical knowledge such as patient history information, blood routine and biochemistry, so that the trainees could get familiar with and go deeper into clinical work more quickly. At the beginning of the training, in order to solve the difficulty of students not knowing where to start when sorting out a large number of clinical data, according to the characteristics of each professional teaching, the Pharmaceutical Care Table for Clinical Pharmacists is formulated, which contains various indicators that should be paid attention to by each professional, so that students can comprehensively and

systematically understand the patient's condition data. In the training process, link management and quality management are adopted, and the indicators of students' teaching medicine history, medical record analysis, medication education, medical record discussion and literature reading report are broken down and detailed by quarter. The pharmacist should review the training documents regularly, on the basis of case study and literature review, in order to achieve the good effect of teaching and learning. Two weeks before the end of the training, a comprehensive assessment of the completion of the training objectives is carried out, and the completion of the trainees is assessed.

#### 4.2. Clinical pharmacist teacher students

The teaching is composed of clinical pharmacist trainees and teacher trainees, and the teaching pharmacist should teach these two students at the same time. In order to ensure the smooth progress of teacher training, it is necessary to strictly control the admission standards of students, such as: students need to have a full-time bachelor's degree or above in clinical pharmacy or pharmacy, and have intermediate or above technical positions in pharmacy, etc., to ensure the learning ability and professional quality of teachers and students. Before the beginning of the training, guide the pharmacist to actively adjust the concept and method of teaching, recognize the direction and focus of teaching, so as to continuously improve their own teaching level and improve the teaching method.

Considering the short training time and heavy tasks of teacher trainees, in order to help teachers and the college better understand the training tasks and requirements, contents such as pharmaceutical case review, case discussion, case examination and theory examination are organized and broken down by week, and pharmacists are guided to teach around these contents, so as to make the training program targeted and targeted. Based on the advantages of the dual training bases of clinical pharmacists and teacher trainees, a standardized teaching model with teaching role simulation and comments by teaching pharmacists has been established to improve the teaching methods and levels of teacher trainees.

Through teaching and training, trainees can master the working mode of clinical pharmacy, cultivate their clinical skills and thinking, enable them to analyze and solve drug use problems encountered in clinical practice, independently complete the work of clinical pharmacists, and assist doctors to improve drug use methods. The specific learning content is shown in Table 1:

Table 1: Learning content Settings

Clinical pharmacist student	Clinical pharmacist teacher student
Introduction of training program and learning requirements for community clinical pharmacists	Drug Therapy Management (MTM)- Opening up a new stage for pharmacists to practice The introduction of community clinical pharmacist training program with MTM as the core
Clinical pharmacy and the value and function of clinical pharmacists	Clinical pharmacy and the value and function of clinical pharmacists
The general process and strategy of prescription and doctor's order review	The general process and strategy of prescription and doctor's order review
The contradiction of drug therapy and its treatment	The application of MTM five elements work scale in practice
Psychosomatic medicine and professional communication skills	Psychosomatic medicine and professional communication skills
Monitoring, evaluation and outcome of adverse drug reactions and drug-induced diseases	Monitoring, evaluation and outcome of adverse drug reactions and drug-induced diseases
Review and theory exam	Review and theory exam

## 5. Training quality monitoring and evaluation system

### 5.1. Quality control system construction

The training and learning effect of many pharmacists are not good, and they are not qualified for the work of clinical pharmacists, which is mainly due to the lack of perfect quality control and evaluation system. It is necessary to establish and improve the quality control and evaluation system of training and teaching. To construct the monitoring system of teaching mode, we must start from the establishment of supervision system, and formulate the management system of teaching plan, practical

teaching and teacher resources. In the process of the implementation of the supervision system, the implementation of the teaching inspection, supervision, review system, and student quality investigation system and other supervision systems. In the process of implementing the supervision system, it is necessary to strengthen the construction of the monitoring team and establish a team of teaching information personnel. At the same time, the relevant departments of the hospital regularly organize trainees to hold special seminars on the quality of training and teaching to improve the quality of training and teaching. It is also necessary to establish a teaching quality assessment and reward and punishment system, and the excellent performance of teachers will be fully reflected in the evaluation of professional titles and evaluation. Appropriate punishment should be taken against teachers who are not effective in teaching.

### ***5.2. Construction of quality evaluation system***

Through the assessment of the learning quality of the pharmacist students, the learning effect of the students can be checked, and the students can pay more attention to the training and learning. The evaluation of clinical pharmacist students was carried out through daily assessment and graduation assessment. The daily assessment is usually conducted every one to two weeks to test the theoretical knowledge and communication skills that students have learned in the recent period of time. The pharmacist will evaluate the results and give feedback. The graduation assessment is usually carried out about a week after graduation, testing the knowledge points required in the teaching syllabus and the professional skills in clinical practice, work attitude and communication ability. Generally speaking, clinical pharmacist students can continue to learn the next step only after passing the examination.

## **6. Advantages of standardized training and teaching mode for clinical pharmacists**

In order to ensure the quality of training for clinical pharmacists, a training plan for clinical pharmacists and a training plan for teacher trainees was designed based on the training guidelines and the differences between the two training methods. Experienced clinical pharmacists were responsible for the formulation, implementation and adjustment of the training plan.

### ***6.1. Demonstration and incentive role***

In China, the development of clinical pharmacy is late, both in terms of policy, or in terms of professional technology, have encountered greater difficulties, so some students feel confused about the future development of clinical pharmacists, and even pessimistic. The training feature of the teaching mode is that the teaching pharmacist can teach students through examples, so that the students can personally experience the working process of the teaching pharmacist, and understand the use of professional knowledge by the teaching pharmacist to provide pharmaceutical care for patients, so as to obtain a sense of success, which has an irreplaceable incentive and demonstration role for the standardized training of students. In addition, the trust and friendship established between the pharmacist and the student in the process of learning and communication not only improves the student's psychological endurance, but also promotes the student's confidence and integration into the clinical practice learning.

### ***6.2. Promote teaching and learning and reduce work burden***

In addition to the training work, the teaching pharmacist is also responsible for many clinical pharmacy work, standardized training and teaching mode can establish a practice base, so that the teaching pharmacist can not only do their own daily work, but also strengthen the practical skills and clinical ability of students, strengthen the teaching effect, improve work efficiency, reduce work pressure. At the same time, teaching mode can better supervise the behavior of teaching pharmacists in clinical pharmacy work, improve the responsibility of teaching pharmacists, and improve the quality of pharmaceutical care.

### ***6.3. Facilitate students to learn tacit knowledge***

The standardized training and teaching mode is very convenient for students to fully participate in the practice of clinical pharmacy. When students encounter doubts, pharmacists can answer questions and provide help for students at any time. At the same time, students can also acquire more tacit

knowledge in the process of working with the pharmacist, such as how to communicate effectively with doctors and patients. Tacit knowledge is of great significance for students to work independently in clinical pharmacy in the future, but it cannot be learned from theoretical teaching.

#### ***6.4. Promoting the development of independent demonstration practices***

So far, the teaching mode of clinical pharmacists has not been specified, so some teaching pharmacists have not allowed students to participate in real clinical work. During the one-year training period, most of the trainees learn by watching or participating in the marginal situation, which is not conducive to improving the clinical practice ability of the trainees. Standardized training and teaching mode can enable pharmacist students to gradually complete the transition of "visit → marginal participation → independent demonstration practice". For example, students observe how to teach pharmacists to conduct pharmaceutical ward rounds from the beginning, gradually participate in the process, and finally realize the process of independent ward rounds, so as to effectively solve the current problem that many students lack basic knowledge and clinical pharmacist experience.

### **7. Training and teaching experience and effectiveness**

#### ***7.1. Training and teaching experience***

##### ***7.1.1. Focus on using problem-based teaching methods***

Problem-based teaching (PBL) is a group discussion teaching model guided by actual cases, based on problems, taking students as the teaching center and guided by teachers [4]. Two people participated in the case study every week, and PBL teaching method was used to obtain good teaching effect. Under the PBL teaching model, the pharmacist and the student select the cases, design the corresponding problems for the cases together, determine the difficulty of the problems according to the training requirements, and focus on evaluating the safety and effectiveness of the clinical drug program. Based on the cases and known problems to be discussed, students collect clinical diagnosis data, consult relevant literature, and make PPT; Clinical pharmacists of various specialties participate in exchanges and discussions, or case seminars organized by participants. Based on PBL, the teaching content is set to difficult clinical cases, and the relevant content of a certain disease is studied in a targeted way to improve the students' problem-solving and self-learning ability. In addition, PBL teaching mode can improve students' ability of making PPT, language expression and data collection, and communication and discussion between different majors can also enhance students' interdisciplinary learning.

##### ***7.1.2. Focus on writing teaching and training documents***

The training guidelines for clinical pharmacists require that trainees must complete a certain number of training materials such as case analysis, teaching drug history, and medication textbooks. In the process of training, some students attach importance to clinical operation and despise document writing, and think that training documents have too much homework, which has no obvious effect on teaching training. At the same time, they are impatient and afraid of difficulties, resulting in low quality of teaching training documents and lack of model teaching. Therefore, at the beginning of the teaching and training, the course of medicine history and case analysis and writing was set up. First, to enable students to better understand the important role of document teaching in clinical thinking construction, professional perspective training and problem solving ability, so as to enhance students' independent learning ability. Second, through teaching training, students can learn the skills of writing teaching medicine history and case analysis, and sort out the excellent teaching medicine history and case analysis written by students in the past for students' reference. In the process of teaching and training, the teaching pharmacist used the "Case Analysis Quality Defect Evaluation Form" and "Teaching Medicine History Quality Defect Evaluation Form" to evaluate the teaching medicine history and case analysis assignments submitted by the school, found the problems and communicated with the students to ensure the writing quality of the documents and achieve the teaching goals.

##### ***7.1.3. Focus on mastering learning methods***

In just one year of training time, it is difficult for students to master all the professional knowledge of professional clinical pharmacists, and after the training, students have to assume a leading role in clinical pharmacy. Therefore, it is very important to understand effective learning methods. Since the knowledge level of each student is uneven, students should be allowed to form the habit of independent learning and adjust according to their own shortcomings; In clinical pharmacy work, it is necessary to

learn the key contents in a point-based way. For example, in clinical practice, if a patient with typical inferior myocardial infarction is encountered, it is not only necessary to look at the clinical symptoms, but also to understand the pathogenesis, clinical manifestations, diagnostic indicators, treatment and prognosis of various types of myocardial infarction, so as to meet similar situations again. Can cope better; In addition, in daily learning, students should listen more, remember more and ask more questions, enhance the perceptual understanding of clinical symptoms, and humbly seek advice on the content of questions to achieve the level of understanding.

#### ***7.1.4. The advantages and disadvantages of standardized training and teaching for clinical pharmacists***

Nowadays, China's clinical pharmacist training is carried out according to the professional, in addition to anti-infection professional training including respiratory, microbiology, ICU, surgery and other departments, the rest of the clinical pharmacist training is carried out in the corresponding clinical departments. Standardized training and teaching mode is conducive to training the clinical thinking of students, so that they can grasp the service ability of diagnosis and treatment guidelines, commonly used drugs characteristics, etc., and become competent for the work of clinical pharmacists faster. However, in the process of training and teaching, it is found that: too much emphasis on specialty training will easily lead to clinical pharmacists' grasp of pharmaceutical knowledge is too simple, and they lack of understanding of drugs outside the specialty; In addition, clinicians have more experience in specialty drug use, but lack of drug use knowledge outside the specialty, which is exactly the starting point for clinical pharmacists to carry out their work. It is suggested that the training of clinical pharmacists should be extended to general training. It is also possible to expand the scope of knowledge based on the training of clinical pharmacists in specialized departments, and to implement rotation learning in departments other than specialized departments. The clinical pharmacist training outline revision meeting held by the Expert Committee of Clinical pharmacists Work of the Chinese Hospital Association discussed the feasibility of the rotation learning mode of departments outside the specialty, hoping to improve the comprehensive ability of clinical pharmacists and carry out professional training of clinical pharmacists on this basis [5].

#### ***7.2. Training and teaching effectiveness***

After one year of training and teaching, students have a certain understanding of the work of clinical pharmacists, can read the diagnostic meaning of common clinical diagnostic images, and initially grasp the drugs that patients need to take at different stages; Familiar with the English abbreviations of common diseases; It can provide some suggestions on pharmacy for clinicians.

With the gradual development of pharmacists towards clinical practice, the work of clinical pharmacists has been put forward with higher requirements. For a long time, the work of pharmacists has mainly focused on pharmacy and drugs, and the knowledge they have learned is relatively old and aging, and they lack clinical practice experience. In clinical drug therapy, the participation level of pharmacists lags behind that of other disciplines. According to the actual situation, the Ministry of Health has established a number of clinical pharmacists training bases throughout the country to systematically improve the ability of clinical pharmacists in theoretical knowledge and practical operation, which will help promote the development of clinical pharmacy.

### **8. Conclusion**

The training time of clinical pharmacists is short and the tasks are heavy, so trainees are required to master the basic ability to provide pharmaceutical services for the hospital during the training process. During the training, both clinical skills and pharmaceutical knowledge are to be understood. Therefore, during the whole training process, pharmacists should choose appropriate teaching methods according to different teaching contents, or adopt a combination of multiple teaching methods. It is better than the traditional theoretical teaching method, so the pharmacist must master a variety of teaching methods and skillfully apply them. However, due to the different knowledge level of the trainees at the beginning of the training, it is necessary to lead the pharmacist to investigate the learning situation of the trainees, understand the learning situation of the trainees, carry out targeted teaching, and improve the training quality.

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