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The Role of the Teacher-practitioner in Integrating Pharmacy Education and Practice: a Pilot Project in Germany

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Pharmacy teacher-practitioners are pharmacists who are employed half-time at the University and half-time in a pharmacy practice. They use actual patient cases and simulated practice situations to teach and facilitate active learning. Teacher-practitioners need to be effective teachers and communicators who maintain proper documentation of their practice activities. As professional role-models, they need to possess pharmacy practice knowledge, a good understanding of the social and economical forces of healthcare and a caring attitude.

In the fall of 2001, clinical pharmacy was integrated into the German pharmacy curriculum as a new core discipline. At the same time, further to develop clinical pharmacy education, a pilot project began at the University of Bonn. The purpose of the project was to assess the role of the teacher-practitioner in German pharmacy practice and education. In this project, the professor of clinical pharmacy and the teacher-practitioner worked closely together.

Keywords: Education; Learning; Teaching; Teacher-practitioner; Problem-based learning

INTRODUCTION

There are many different techniques and styles of teaching, learning and curricula in pharmacy. Integrating pharmacy education with practice is a permanent challenge in both fields. As has been shown, a separation of academia from practice has negative consequences for both (Cipolle *et al.*, 1998). On the one hand, constant input of new knowledge generated by research is required to maintain a high standard of practice. On the other hand, teaching without links to practice often leads to a situation where the students focus solely on the accumulation of knowledge. When the students enter pharmacy practice, they often have difficulties applying this knowledge and forget most of the fundamentals they have learned at the university.

The best situation occurs when all components of the educational experience (teaching, research and practice) are combined in a clearly defined and articulated manner for the overall purpose of educating well-prepared pharmacists (Kerr, 2000). Figure 1 depicts the components of pharmacy. As is shown, the school of pharmacy provides pharmaceutical sciences, or the foundation of the triad, for pharmacy practice. The university and practice relationship not only adds practice relevance to the curriculum, but also the possibility for pharmacy practice research.

The teacher-practitioners, who work half-time at the university and half-time in practice, can play an important role in integrating these components (as seen in Fig. 1) and encourage a self-directed learning atmosphere for students. As teacher-practitioners work in both university and practice settings, they can teach by means of patient cases from both their current practice and directly at the bedside. In some countries, such as the UK, teacher-practitioners are well established in community and hospital settings and present in all schools of pharmacy (Walker, 1996). In other countries, such as Germany, they are practically unknown.

CHARACTERISTICS OF A TEACHER-PRACTITIONER

At the university, as well as in practice, the teacher-practitioner should represent a role model

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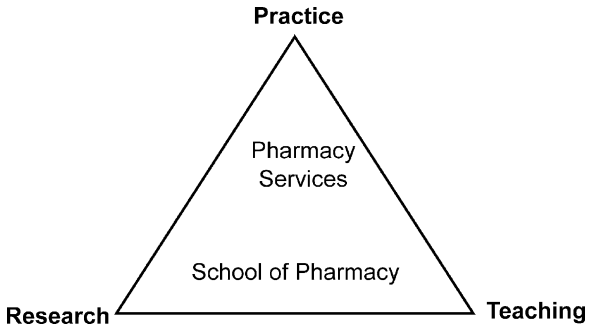

FIGURE 1 Integration of research, education and practice.

possessing the qualities expected of anyone who provides a personal health service (concern, attentiveness, empathy and compassion). This is largely manifested through the type of questions asked and the depth of interaction. Based on this attitude, the teacher-practitioner becomes a personal motivator for students while accommodating the learning needs of both the group and individual.

For example, when a student presents a patient case, the teacher-practitioner should listen and consider what is of practical relevance. The teacher-practitioner then poses questions to challenge the student by promoting creative and independent thinking. By encouraging the student to take issue with various points of view, the teacher-practitioner effectively stimulates group discussion while exposing all sides of an issue. This form of learning teaches them how to make decisions or support their views, as well as how to ask and answer questions within a group. This later helps them to interact in a team environment as well as learn their role. In the end, the teacher-practitioner's larger knowledge base is used to direct learning, never to overpower the learners. As Brodie *et al.* (1977) further explain, by showing patience with the students and their questions, the teacher-practitioners lead them to reasonable conclusions and professional judgments. As effective teachers, they plan by defining objectives and designing a structure within which the students can apply their academic knowledge, whether in the classroom or in practice. By promoting the concept of teamwork and integrated systems of care, the students can build communication skills by effectively learning through the interactions with others.

When applied to a specific set of circumstances, these traits are used to make valid judgments regarding drug usage. As is the case with all pharmacists, teacher-practitioners must be committed to a lifelong, regular habit of reading current literature in order to maintain and update their knowledge base. Additionally, as providers as well as teachers, they must be aware of the societal need for pharmacy services, be able to adapt to the existing and changing role of pharmacy and, when necessary, explain the social and economical implications of drug use, pharmaceutical services and healthcare forces. In addition, these methods and traits may help accomplish an even greater goal of directing the philosophy of pharmacy practice toward a more patient-centered ethos.

SITUATION IN GERMANY

The License Ordinance for Pharmacists ("Approbationsordnung für Apotheker") defines the same curriculum for all German schools of pharmacy. Before October 2001, the Pharmacy curriculum consisted of four main disciplines: pharmaceutical chemistry, pharmaceutical biology, pharmaceutical technology and pharmacology and toxicology. Pharmacy education was focussed primarily on the drug, wherein the patient and his or her therapy played no role. In order to adapt pharmacy education to the changing healthcare system and to meet present and future requirements in pharmacy practice, the License Ordinance for Pharmacists was changed in October 2001. Clinical pharmacy was introduced as a fifth main discipline with an additional final examination. Figure 2 shows the contribution of the individual pharmaceutical disciplines before and after this curriculum change. Table I lists the subjects during the new oral examination. Without giving up the fundamental basis of pharmacy in natural sciences, all German students are now taught to apply their scientific

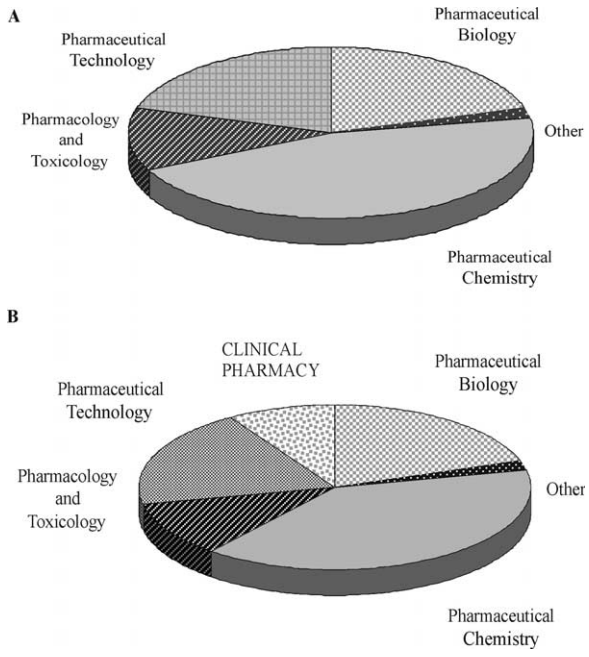

FIGURE 2 Required hours in the individual disciplines with respect to the changes of the pharmacy curriculum in Germany (A: Curriculum of 1989; B: Curriculum of 2001).

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TABLE I Clinical pharmacy as a new main discipline in Germany: catalogue of subjects for the second state examination (Gaudich, 2001)

- Special pharmacotherapy; drug therapy in pregnancy and lactation, pediatrics, geriatrics, in patients with organ dysfunction, multi-morbidity; importance of formulation and mode of administration in drug therapy; dialysis procedures, special therapy regimen considerations in antibiotic therapy, oncology and supportive therapy, anticoagulation therapy, immune and gene therapy, as well as for intensive care patients; criteria for drug evaluation
- Medication history; evidence-based medicine; evaluation of clinical relevance of adverse effects, drug interactions and incompatibility, evaluation of combination therapies; causes of variability of therapeutic outcome; therapy recommendations with regards to defined patient cases; therapeutic drug monitoring, the handling of patient charts; medical devices for administration of drugs as well as enteral and parenteral nutrition
- Compliance/non-compliance; fundamentals and methods of pharmaceutical care
- Relationship between pharmacodynamics and pharmacokinetics; population pharmacokinetics; clinical pharmacogenetics
- Malnourishment; energy and nutritional requirements; enteral and parenteral nutrition
- Healthcare societal and economical influences, pharmacoepidemiology and pharmacoeconomics; pharmacovigilance, quality of life issues, ethical aspects

knowledge to patients and their specific needs. It is indeed a big challenge for all German schools of pharmacy to implement this new discipline on a level that is simultaneously science-based, practice-relevant and patient-centered. Not surprisingly, the level of integration amongst the disciplines is now extensively discussed.

In an endeavor to promote clinical pharmacy education in Germany and to help with the transition, a pilot project was created at the University of Bonn to design and establish the teacher-practitioner position. This project began in the fall of 2001 in order to identify and overcome the problems related to the establishment of the teacher-practitioner position in Germany. Currently, a teacher-practitioner works at the school of pharmacy in accordance to a functional model. This model considers the major responsibilities of university professors to perform high-quality research and teaching (Fig. 3). Within a student-centered learning model, a professor of clinical pharmacy and the teacher-practitioner have a close working relationship. Combining the professor's connection to the scientific community and the teacher-practitioner's connection in practice, a partnership and platform for exchanging ideas and contacts is created. This model also helps to illustrate how co-operation with scientific assistants and hospital and community pharmacists additionally enhances the learning development in the students.

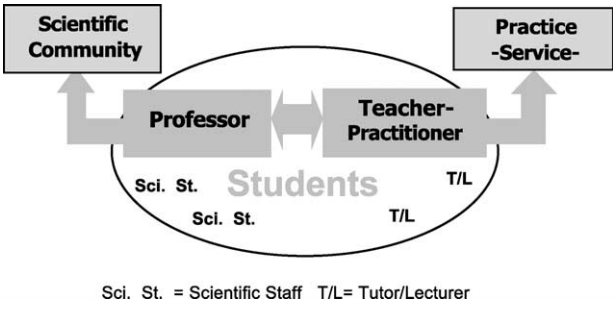

FIGURE 3 Role of the teacher-practitioner at the University.

ACTIVITIES OF THE TEACHER-PRACTITIONER AT THE UNIVERSITY OF BONN

At the University of Bonn, the tasks of the teacher-practitioner involve under-graduate and post-graduate education as well as clinical pharmacy practice at the bedside.

Undergraduate Education

Since 1999, the University of Bonn has offered an optional course in clinical pharmacy and pharmacotherapy within which students apply their knowledge about medicines by using patient cases and participation in simulated practice setting activities. The relationship between education and practice is an integral part of this course. This relationship is strengthened through the invitation of speakers from different practice settings to lecture and conduct open discussions with the students. For example, the professor, together with assistants (the teacher-practitioner and a pharmacist from a local hospital) facilitates discussions and learning in a workshop on therapeutic drug monitoring. During this workshop, the students work in groups of three to four with computer software in a simulated practice setting and present their recommendations and outcomes. In this setting, the professor and scientific assistants primarily bring pharmacokinetic methodology into the discussion, while the practitioners focus on practical implications and significance.

Within the clinical pharmacy and pharmacotherapy course, it is now the task of the teacher-practitioner to explain to the students how to provide pharmaceutical care as well as how to organize data for documentation and effective working habits by using the Subjective and Objective Information and Assessment Plan (SOAP) approach. Within this workshop, small groups of students learn how to:

(1) apply the patient care process focusing on patient interviewing through role playing,
(2) ascertain where and how to find patient information,
(3) identify potential and actual drug-related problems,

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TABLE II Activities of the teacher-practitioner at the University of Bonn

Practice activities	University activities
• Ward rounds with medical team: Patient evaluation, counseling and monitoring	• Seminar/workshops within the courses "Clinical pharmacy and pharmacotherapy" and "Drug information"
• Drug information services	• Seminar within the students practical year
• Ward rounds with students	• Collecting patient cases for teaching
• Continuing education for medical staff	• Help with the development of a continuing education program for post-graduate studies
• Assist the Pharmacy and Therapeutics Committee: cost analysis, drug formulary review*, guidelines/policy and procedures*	• Help with the implementation of curriculum changes in co-operation with other faculty members*

* Activities in planning.

(4) analyze the information for possible alternatives,
(5) develop a patient care plan (whenever possible together with the patient) involving goals, monitoring strategies and a follow-up plan and
(6) documenting the consultation.

In addition, the teacher-practitioner works as a tutor for the students during other simulated practice activities and brings the students to the hospital for learning at the bedside. This helps the students understand how the newly-gained knowledge can be applied.

Post-graduate Education

Due to the recent change of the pharmacy curriculum and an increasing demand for personnel qualified in patient-oriented services, there is a significant need for post-graduate education, particularly among recent graduates who studied the prior curriculum that excluded clinical pharmacy. Therefore, the professor of clinical pharmacy in Bonn and the teacher-practitioner developed a certificate program for working pharmacists. It involves four modules at the University over one year and practice activities in their own working environment. The latter involves online and direct support from experts with practical experience. This design has been selected in order to facilitate the practical implementation of clinical pharmacy and pharmaceutical care.

Clinical Pharmacy Practice

In the hospital, the teacher-practitioner works together with the director of pharmacy services, the hospital director and other healthcare professionals. The individual activities are summarized in Table II. Among these, there is an interdisciplinary, quarterly patient case workshop for physicians and pharmacists designed to improve the mutual understanding and collaboration between both professions. The academic staff from the university also participate at these meetings and provides academic input. Mutual collaboration is further conducted through training pharmacy and medical students together, on a small scale, during ward rounds. Additionally, as in many countries, practice pharmacy research is needed and is another possible important task for the teacher-practitioner after the development of the position, especially in documenting the value of clinical pharmacy services (Helling and Nelson, 2000).

CONCLUSION

In conclusion, exposure to pharmacy practice provides students an opportunity to enhance their abilities to apply the pharmaceutical sciences to complex practice problems. This exposure also helps the students build confidence, feel more comfortable working as patient care providers and develop a clearer understanding of the various roles of the pharmacist. The recent addition of clinical pharmacy as a core discipline into the German pharmacy curriculum offers the possibility of the introduction of the teacher-practitioner. By working together with faculty and practitioners, the teacher-practitioner draws on the expertise and strength of each component for the promotion of a more comprehensive, improved pharmacy education and practice. As is evidenced in the Bonn pilot project, the implementation of the teacher-practitioner position begins with finding the right person, finding the right organization for collaboration, drawing on supportive connections and, most of all, learning together.

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