

## INSTRUCTIONAL DESIGN AND ASSESSMENT

### An Interprofessional Rural Health Education Program

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**Objectives.** To develop, implement, and assess an interprofessional rural health professions program for pharmacy and medical students.

**Design.** A recruitment and admissions process was developed that targeted students likely to practice in rural areas. Pharmacy students participated alongside medical students in completing the Rural Health Professions program curriculum, which included monthly lecture sessions and assignments, and a capstone clinical requirement in the final year.

**Assessment.** Fourteen pharmacy students and 33 medical students were accepted into the program during the first 2 years of the Rural Health Professions program. Approximately 90% of the rural health professions students were originally from rural areas.

**Conclusions.** The rural health professions program is an interprofessional approach to preparing healthcare providers to practice in rural communities.

**Keywords:** assessment, interprofessional, rural healthcare, underserved, rural pharmacy

## INTRODUCTION

Demand for pharmacists in rural communities continues to increase and depends on several factors including characteristics of the rural population (ie, elderly and those with chronic illnesses tend to require more prescriptions), economic factors, and employment.<sup>1</sup> Maintaining an adequate number of pharmacy professionals in these communities may be even more of a challenge in light of the shortage of primary care physicians in these areas. In some areas, a pharmacist may be the only healthcare professional in the community.

Because rural pharmacy education is a relatively new concept, there is minimal data to indicate the factors that influence a student to select a rural community in which to practice pharmacy. In 1992, a group from the University of Nebraska College of Pharmacy examined factors that potentially impacted the choice of a rural or urban site for Nebraska pharmacists.<sup>2</sup> Graduates choosing rural practice either grew up in a rural community (60% were from towns with less than 5,000) or had some practice

experience in a rural community during their pharmacy education. Investigators from the University of North Carolina School of Pharmacy reported that location of a rural pharmacy program could impact a student's decision to enroll.<sup>3</sup>

Several factors appear to be applicable to practice in a rural community. A rural background or upbringing was the primary reason pharmacy graduates chose this type of community to practice pharmacy.<sup>4-6</sup> Additionally, intention to practice in a rural Australian community was influenced by completing rural-oriented practical experiences as well as participation in a rural pharmacy-focused (BPharm rural) curriculum.<sup>7</sup>

Financial incentive may be another determinant in pharmacy students' choice of a rural practice environment. The University of Minnesota offers a loan forgiveness program for healthcare students who agree to work a minimum of 30 hours per week, 45 weeks per year for at least 3 years in a designated rural area of the state.<sup>8</sup>

The State of Illinois workforce projections indicate at least 100 pharmacists will be needed in its rural counties from 2012-2016 to replace pharmacists who are retiring and to accommodate increased demand for pharmacy professionals (Tom Austin, Economic Information and Analysis Division, Illinois Department of Employment Security, 2009, personal communication).<sup>9</sup> These data on the workforce shortage and the published

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literature on factors that impact the recruitment and retention of pharmacists in rural communities led to the development of a rural pharmacy curriculum at the University of Illinois at Chicago College of Pharmacy (UIC-COP). In addition, this program meets the critical component of interprofessional education emphasized by the Accreditation Council for Pharmacy Education (ACPE), the Interprofessional Educational Collaborative, and the Center for the Advancement of Pharmaceutical Education.<sup>10-12</sup>

The University of Illinois College of Medicine has graduated primary care physicians who practice in rural Illinois for nearly 20 years. As of March 2012, there were 211 graduates with 160 of them active (76%). Of these, 61% practiced in towns of 20,000 people or less, and 23% practiced in towns of 5,000 or less. Sixty-nine percent have remained within their original practice location, and the mean length of time in the community was 4.3 years, with a range of 0.6 to 10.6 years.

The purpose of this program was to develop an interprofessional rural healthcare curriculum for pharmacy students. The initial assessment was to determine if students from rural areas were recruited and enrolled.

## DESIGN

The University of Illinois at Chicago College of Pharmacy located in Chicago's medical district has been in existence for more than 150 years and has traditionally trained pharmacists who practice in the Chicago metropolitan area. Since the College's inception, approximately 66% of alumni have remained in Illinois and an overwhelming majority (50%) in the greater Chicago area.

In 2010, The University of Illinois at Chicago College of Pharmacy's Rockford campus was created to provide students an alternative in-state education site approximately 90 miles outside of the Chicago. A unique offering on the Rockford campus is the Rural Health Professions program, which was also established in 2010, which complements the same University of Illinois at Chicago Doctor of Pharmacy curriculum for select rural students. The Rural Health Professions program is a collaborative effort between the University of Illinois at Chicago Colleges of Medicine and Pharmacy and the National Center for Rural Health Professions (NCRHP), an interprofessional center with a mission of promoting the health of rural communities through partnerships in education, service, research, and policy. The overall goal of the program is to graduate pharmacy and medical students who will return to live and work in rural Illinois. All Rural Health Professions program students are based at the Rockford campus however, they spend some time at the Urbana campus as well.

In 1990, the Illinois Rural Downstate Health Act formally established the Rural Medical Education program (RMED) to improve access to physicians and healthcare services in rural shortage areas in Illinois. The RMED program is a major program of the National Center for Rural Health Professions. Since the program's inception, students have participated in the college of medicine curriculum, meeting all of the requirements of other University of Illinois students, and participate in an "add-on" rural-focused curriculum. The charter class of Illinois RMED program was initiated after the administrators traveled to rural communities over a 2-year period to discuss forming partnerships, developing a curriculum, and establishing a rural recruitment component. The retention rate of graduates from the RMED program has been the highest in the nation, with nearly 80% of graduates living and practicing in rural Illinois communities.<sup>13</sup>

To move the NCRHP mission forward, in 2010, the Rural Pharmacy Education (RPHARM) program was created. In addition, an interprofessional Rural Health Professions (RHP) program was formed that included the RMED and RPHARM students. The intention in the coming year is to include additional health professions disciplines such as nursing, social work, public health, and dentistry. A formal recruitment and admissions process was developed for the Rural Health Professions program, along with a curriculum based on the Rural Medical Education curriculum. In addition, learning objectives, outcomes, and an assessment strategy were created by an interprofessional faculty group based on the Rural Medical Education curriculum, and included ACPE and Liaison Committee on Medical Education standard requirements as well.

The UIC-COP Chicago campus accepts 165 pharmacy students and the Rockford campus accepts 50 pharmacy students per class year. There are 15 pharmacy student slots available for the RPHARM program and 15 to 20 medical student slots available for the RMED program per class year. Non-rural pharmacy and medical students are also trained on the Rockford campus.

## RHP/RPHARM Recruitment and Admissions

Students from rural communities in Illinois learn about the Rural Health Professions program through various sources. Program recruiters meet with students at community colleges, local and state colleges, and universities to increase awareness of the program and recruit potential students who might not have otherwise considered a career as a health professional. Recruiters target those areas with a rural urban commuting area (RUCA) code<sup>14</sup> of 4 or higher. In addition, prospective students are

introduced to the program through interaction with rural community preceptors and by accessing Internet-based information.<sup>15</sup>

Applying to the Rural Health Professions program was done through the UIC-COP application process. An electronic application was submitted through the PharmCAS system (American Association of Colleges of Pharmacy, Alexandria, VA), and if the applicant had attained the college's minimum GPA of 2.75, the applicant was asked to complete a supplemental UIC College of Pharmacy application. In addition to students who self-identified an interest in rural pharmacy on the application, all applications were prospectively screened for rural home zip codes to identify students who did not self-identify a rural health interest on their application but who might be a good fit for the Rural Health Professions program. Applicants to the Rural Health Professions program also were asked to obtain 3 letters of recommendation from community leaders in their rural hometown in addition to the 3 academic letters required for regular college of pharmacy admission.

An additional RPHARM-specific application modeled after that used for the RMED program was sent to candidates to better assess their "rurality" and "fit" for the program.<sup>16</sup> After all applications and associated materials were submitted and screened, an interview was scheduled with the most-qualified candidates.

Screeners review and score the applications related to evidence of rural background and/or serious intent to work in rural areas. Screeners from the college, consisting of local faculty members, met to review completed applications. Potential candidates were identified on the basis of academic merit and compatibility with the goals/mission of the Rural Health Professions program, as determined by students having a rural background, leadership experience, community involvement, and an expressed commitment to rural pharmacy practice.

Candidates were then invited to interview with the Recruitment and Retention Committee on the Rockford campus. This was an interprofessional, ad hoc committee made up of rural health professionals and community members from various geographic locations in Illinois, as well as current student representatives from the Rural Medicine and Rural Pharmacy programs. The committee was charged with creating a list of candidates who, in the committee members' collective view, were likely to pursue careers as rural healthcare providers.

## Curriculum

The curriculum was developed based on observations of other rural medical education programs as well as extensive discussions with medical and public health

educators. A key concept, given a rural health professional's close ties to the community, was the integration of clinical practice and population health. The program rationale reflected the core components identified in Pathman and colleagues' examination of community dimensions of primary care practice.<sup>17</sup> From the first to the fourth year, the curriculum covered: community and population health; healthcare delivery in rural communities; understanding and developing a community-oriented primary care project; and immersion in rural community clinical experiences.<sup>18</sup>

Students accepted into the college and the Rural Health Professions program completed the same coursework required of all pharmacy students. In addition, they participated in the supplemental, parallel Rural Health Professions program curriculum which consisted of monthly lecture sessions and related assignments during the first 3 years and a capstone clinical requirement in the fourth and final year (Table 1). The student learning objectives for the Rural Health Professions program are listed in Table 2. The Rural Health Professions program curriculum was separate from the other curriculum in each college. Pharmacy students achieved 6 hours of elective course credit for their work in the Rural Health Professions program (12 hours of elective course credit are required for graduation). Pharmacy and medical students in the Rural Health Professions program attended class together and participated in practice experiences, making the curriculum uniquely interprofessional.

## EVALUATION AND ASSESSMENT

An orientation survey was administered to all RHP students in the inaugural class of 2014 and the subsequent class of 2015. Results were compiled and analyzed using IBM SPSS, version 2.0 (SPSS Inc, Chicago, IL).

All students also completed a questionnaire which gathered contact information for each student as well as the students' family and/or friends to ensure the students could be tracked after graduation in the event the graduate could not be contacted directly. The study was approved by the University of Illinois Institutional Review Board.

## State of Illinois County Status

The 2003 RUCA codes were used to classify each county's rural/urban status. Using this criteria, there are 84 rural and 19 urban counties in Illinois.<sup>14</sup> These codes were developed by the US Department of Agriculture and use a census tract-based classification scheme from the Bureau of Census for urbanized area standard and place definitions in combination with commuting information to characterize the extent of rural characteristics and

Table 1. Curriculum Focus and Learning Activities of the Rural Health Professions Program Course, Years 1 to 4

Year	Curriculum Focus	Activities
Year 1	Concepts of population based healthcare, agricultural hazards and farm safety, health resources development, rural mental health, rural community based research, rural leadership and negotiation skills.	2-day orientation 7-9 monthly seminars (3 hours each) 2 field trips (1-2 days in length) 1 conference (optional) Informal feedback sessions
Year 2	Application of rural community health concepts including primary care/family medicine, introduction to clinical aspects of rural healthcare delivery (i.e. specific disease states and/or healthcare issues especially those related to psychosocial and behavioral dimensions), continued exploration of clinical research concepts in rural communities, introduction to collaborative team approaches to healthcare.	9 monthly seminars (3 hours each) 3 field trips (1 day in length) 1 conference (optional) Informal feedback sessions
Year 3	Application of clinical research concepts and skills, ethics in rural healthcare, multidisciplinary practitioner perspectives, continued exploration of community-based healthcare concepts	9 monthly seminars (3 hours each) Informal feedback sessions
Year 4	Clinical skill development and application of concepts learned throughout the curriculum. Completion of COPC Project.	In addition to discipline specific clinical experiences RPHARM & RMED student partners will complete a COPC project in their chosen rural community RPHARM RMED Practical experiences in hospital, community, and ambulatory (6 weeks each) pharmacy practice in a rural IL community 16-week preceptorship in rural Illinois community working with a rural family physician

Abbreviations: COPC = community-oriented primary care; RMED = Rural Medical Education; RPHARM = Rural Pharmacy Education.

metro proximity of an area. RUCA codes range from 1 (the most urban) to 10 (the most rural), with additional information indicated by decimals. Of the 84 rural Illinois counties (those with a RUCA code of 4 or more), 96% (81

of 84) were also designated as either geographic or low-income primary care health professions shortage areas in 2009. Only 3 rural counties were not designated as primary care shortage areas.<sup>9</sup>

Table 2. Learning Objectives Rural Health Profession Program Students

Develop an understanding of methods of interacting with rural communities to enhance health.
Identifying and intervening in community health problems using community-oriented primary care (COPC) approaches
Socio-cultural awareness in patient care
Informed and appropriate use of community health resources
Community involvement and attachment
Examine the importance of integrating public/community health and medical models.
Gain an appreciation for how larger, structural forces may impact the health of individuals within given geographical, ethnic, etc., populations
Develop an understanding of pertinent health issues in rural America and, specifically, rural Illinois
Uncover and expand the acceptable roles and responsibilities of rural healthcare providers in maintaining/enhancing the health/well-being of individuals both within and outside the context of the examination room. This includes assuming leadership positions to impact (for example) rural health policy at the local, state, and national levels.
Translate a <i>basic knowledge</i> of COPC into a <i>working understanding</i> of how: 1) COPC can affect a desired change in the health status of a local populous; and 2) such efforts may be practically implemented.
Display knowledge, attitudes and behaviors consistent with rural healthcare practice including but not limited to teamwork, communication and an understanding inter-professional health care models.



## Assessment

The college developed an extensive evaluation plan that included assessment necessary for monitoring rural pharmacy students and Rural Health Professions program outcomes and success. Specific items including a student orientation survey and assessment forms for introductory and advanced rural pharmacy practice experiences were adapted from the rural medicine program and revised so they were appropriate for both pharmacy and medical students to use.

The zip codes of admitted students were added to the overall assessment plan of the College of Pharmacy. The zip codes allowed the college to track the home location of the entering class and applicants to determine if recruitment efforts by the program were successful. In addition, the zip code of each graduates' first employer was incorporated into the assessment plan to track and evaluate where graduates practiced after graduation. This allowed investigators to assess the rural mission of the Rural Health Professions program.

**Class of 2014.** Twenty-two students (6 pharmacy and 16 medical) were admitted to the class of 2014 Rural Health Professions program. All 22 completed the orientation survey instrument. Approximately 95% of the

students were originally from a rural area (n=21), Ninety-five percent were Caucasian, and 5% were Asian (n=1). All but 1 student (95%) were born between 1982 and 1988.

**Class of 2015.** Twenty-six students (8 pharmacy and 18 medical) were admitted to the class of 2015 Rural Health Professions program. Approximately 85% were from a rural area (n=22), and 92% were Caucasian. All 26 students were born between 1983 and 1991.

For the 2 admission cycles, over three-fifths of the rural students were women (Table 3). Most (93%) of the students were unsure of their intention to complete a residency after graduation.

## DISCUSSION

Given the Rural Medicine program's record of success, the college believed that training pharmacists for rural practice would be just as successful. The faculty derived much of the interprofessional curriculum and assessment strategy from the established medical program. The curriculum content was revised and expanded to interprofessional cases and situations, as were the assessments; this made the transition easy overall. Recruitment to the Rural Health Professions program appears

Table 3. Demographics and Background Information of Class of 2014 and 2015 Students Entering the Rural Health Profession Program

	Class of 2014 (n=22), No. (%)	Class of 2015 (n=26), No. (%)	Classes Combined (n=48), No. (%)
Grew up in a rural area			
Yes	21 (95)	22 (85)	43 (89)
No	1 (5)	4 (15)	5 (11)
Gender			
Male	11 (50)	7 (27)	18 (38)
Female	11 (50)	19 (73)	30 (62)
Ethnic Background			
African American	0	0	0
American Indian	0	0	0
Asian	1 (5)	2 (8)	3 (6)
Caucasian	21 (95)	24 (92)	45 (94)
Hispanic/Latino	0	0	0
Intention to complete a residency after graduation <sup>a,b</sup>			
Yes	0	0	0
No	5 (83)	8 (100)	13 (93)
Maybe	1 (17)	0	1 (7)
Intention for practice upon graduation <sup>a,b</sup>			
Community	3 (50)	6 (75)	9 (64)
Hospital	1 (17)	0	1 (7)
Clinical	1 (17)	0	1 (7)
Unsure	1 (17)	2 (25)	3 (22)

<sup>a</sup> Class of 2014 RPHARM=6

<sup>b</sup> Class of 2015 RPHARM=8

successful as nearly all students entering the program are from rural areas. In addition, support from the state of Illinois has made program implementation smoother.

The curriculum is being refined to reflect the now collaborative and interprofessional nature of the program. The faculty meets with students regularly to determine how the program is progressing. No significant issues have been identified to date.

There are other rural pharmacy programs in the United States; however, none has a fully integrated interprofessional curriculum.<sup>19</sup> The interprofessional nature of the program is useful for achieving the goal of preparing students for team-based practice, and its importance is supported by the ACPE Standards 2007 and the Interprofessional Education Collaborative.<sup>10,11</sup> Students benefit from this type of integrated curricular structure by gaining hands-on experience working with other health-care professional students. They also gain an appreciation for their potential impact on rural Illinois. This collaboration will provide future rural practitioners (pharmacists, physicians, and potentially other health professionals) with practical, applied knowledge and skills that include effective communication and interprofessional collaboration to improve patient care.

The practice outcomes from the RPHARM program will not be known for at least 2 more years. The goal is that the number of pharmacy graduates returning to rural practice will increase as the Rural Health Professions program continues.

## SUMMARY

An interprofessional, rural education program was developed that merged pharmacy students into a rural health professions program based on an existing rural medicine program. The curriculum was modified to incorporate the inclusion of pharmacy students. Medical and pharmacy students who entered the program had similar demographics, with the majority recruited from rural areas which, based on the literature, will increase the likelihood of them choosing to practice in a rural practice setting.

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