Preceptor Development Series

Application of the Layered Learning Practice Model in an Academic Medical Center

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Abstract

The layered learning practice model (LLPM) is a teaching strategy designed to train residents to precept students and other residents with the oversight of a seasoned clinical pharmacist. This model serves as a tool for residency programs to implement quality precepting opportunities and learning experiences as they look for new ways to integrate multiple learners into the practice setting. The levels of the LLPM include a senior preceptor, resident, and student. It is best implemented through utilization of 4 steps: orientation to the LLPM, preexperience planning, implementation, and postexperience evaluation. Orientation introduces preceptors and residents to the LLPM and outlines expectations for each precepting level. Preexperience planning allows the resident to take a leadership role in developing calendars, rotation activities, rubrics, and activities that match goals and objectives. For implementation, the senior preceptor maintains an active role with all learners; the resident serves as the student's primary preceptor and is responsible for incorporating the student into clinical activities, evaluating student work, and providing feedback. Postexperience evaluation is designed to solicit and provide feedback to the resident and student and to identify recommendations for improvement of the LLPM. Overall, the LLPM is a multi-layered model incorporating the expertise and unique learning positions of the senior preceptor, resident, and student. Redistributing components of the senior preceptor's responsibility amongst learners may result in expansion of patient care and clinical services and help satisfy the increasing demands placed on pharmacists.

Key Words—pharmacy education, pharmacy residency, preceptor, professional education, student

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The pharmacy profession has seen a significant increase in the need for experiential training sites due to an increased number of pharmacy learners.¹⁻³ The number of pharmacy schools in the United States has increased 65% over the last 15 years, from 80 in 2000 to 132 in 2015, producing dramatic growth in the number of pharmacy students and graduates.⁴

Furthermore, the growth in pharmacy graduates has led to more applicants seeking postgraduate training, resulting in an increased demand for additional residency positions. From 2011 to 2015, the number of pharmacy residency applicants increased by 38%, and the number of applicants who did not match with a program increased by 30%.⁵ Despite the increase in

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applicants, the current growth in residency positions has not met the need of unmatched applicants. This has led the American Society of Health-System Pharmacists (ASHP) to call for the creation or expansion of residency programs.⁶

The growing number of pharmacy students and graduates has posed a challenge to preceptors and institutions in balancing clinical and precepting duties.⁷ Preceptors must maintain their respective area of expertise in order to provide quality learning experiences, but they also have to take on increased precepting responsibilities for additional learners.^{6,8} Furthermore, many preceptors also face growing clinical expectations from the institution to achieve better patient outcomes, yet resources such as space, equipment, and funding are often limited. Financial support continues to be limited for expansion of residency programs, preceptor development resources, and clinical positions.¹ To capitalize on available resources without compromising the quality of patient care or experiential education, residency programs are looking to identify alternative methods of clinical teaching.^{6,9}

The layered learning practice model (LLPM) is one approach that pharmacy residency programs may implement to expand services and meet the needs of the increased number of learners. Initially described by the University of North Carolina (UNC) Hospitals, the LLPM is designed to train residents to precept students and other residents under the supervision of a clinical preceptor.^{10,11} The LLPM has been shown to increase medication reconciliation, discharge counseling, and the overall number of pharmacy interventions.^{12,13} Additionally, learners participating in the LLPM had an overall positive perception of the experience and had improvements in knowledge.¹¹ However, few studies have described the implementation of the LLPM into an existing residency program, while detailing specific precepting roles and responsibilities of each layer of the LLPM. The objective of this article is to describe the implementation of a LLPM within a pharmacy residency program at a tertiary care academic medical center.

PRACTICE SETTING

The Durham Veterans Affairs Medical Center (DVAMC) is a 271-bed tertiary care, teaching, and research facility in Durham, North Carolina. The practice site has 6 postgraduate residency positions, 3 postgraduate year 1 (PGY1) residents, and a postgraduate year 2 (PGY2) resident in drug information, geriatrics, and oncology. Residents are encouraged to apply to a teaching certificate program in coordination

with the UNC Eshelman School of Pharmacy, with an option for PGY2 residents to complete the Stanford Faculty Development Program in Clinical Teaching through an affiliation with Duke University Medical Center Geriatric Fellowship Program.¹⁴ Both of these programs expose residents to teaching strategies and precepting concepts, and resident precepting is heavily emphasized within the residency program. In addition, the DVAMC is academically affiliated with Campbell University College of Pharmacy & Health Sciences and the UNC Eshelman School of Pharmacy and hosts 75 to 100 student-months per academic year. The high volume of student months is primarily dispersed amongst clinical rotations with preceptors who also precept for residency rotations.

ADAPTATION OF THE LLPM

The LLPM was implemented at the DVAMC to accommodate the large number of learners simultaneously on rotation. To adapt the LLPM to our site, participating faculty and the PGY1 Residency Program Director collaborated to establish fundamental elements of the LLPM specific to our program. It was first piloted in an ambulatory care rotation in 2010 and was later expanded to internal medicine, geriatrics, drug information, and administration practice experiences. Since initial implementation, the LLPM has evolved to maximize the model's efficiency and learning experience from each level's perspective. The model involves a minimum of 3 layers of precepting consisting of a pharmacy attending as the senior preceptor, a postgraduate resident, and a pharmacy student. The senior preceptor is the preceptor on file with the school of pharmacy or residency program and oversees the full rotation experience with ultimate responsibility for evaluations, grade assignments, and patient care. The second level of precepting is the postgraduate resident, who serves as the primary preceptor for other learners while receiving coaching and feedback from the senior preceptor. Based on the number of learners, rotations may have PGY2 residents precept PGY1 residents, PGY1 residents precept pharmacy students, or a combination. Students are incorporated into the third level of the learning model with active involvement in direct patient care activities. Implementation of the LLPM was encouraged for all rotations accommodating more than one level of learner, but remained voluntary for senior preceptors. Currently, the majority of eligible learning experiences utilize the LLPM during the residency year. **Figure 1** provides an overview of the responsibilities for each role within the LLPM at the DVAMC.

Figure 1. Overview of the roles and responsibilities in the layered learning practice model.

APPLICATION OF THE LLPM

For successful incorporation of the LLPM into the residency program, we follow a 4-step process based on our experiences and collective feedback to date. This process includes (1) orientation to the LLPM, (2) preexperience planning, (3) implementation, and (4) postexperience evaluation. The 4 stages used to apply the LLPM are summarized in **Figure 2**.

Orientation

Detailed orientation to the LLPM occurs for all new practitioners and preceptors, including residents, who are unfamiliar with the model. The preceptor orientation focuses on implementation methods unique to the practice site and provides the opportunity for practitioners to ask questions and exchange ideas. Orientation to the LLPM may be utilized as a preceptor development program for the residency program, as well as part of a preceptor-in-training developmental plan. Additionally, ongoing preceptor development was implemented to provide resources and support.

Prior to the learning experience, the senior preceptor arranges a prerotation orientation with each resident serving as a preceptor. This includes an overview of rotation logistics, activities, and expectations

of each layer in the practice model and should allow the resident adequate time to prepare for the learning experience. School- or rotation-specific requirements such as presentations, patient care activities, and clinical responsibilities are also reviewed. A resident-specific syllabus and rotation calendar are provided. The senior preceptor shares copies of previous student syllabi and calendars to assist the resident in preparing for the student's rotation. Copies of evaluations and assessment tools are also provided for residents.

Resources for preceptor development are important to make available for each resident and potential topics may include evaluating students, providing feedback, facilitating topic discussions, and conflict resolution.¹⁵ The resident's prior experience in precepting is discussed to determine the extent of resident involvement as a preceptor and to accurately identify focus areas for the upcoming preceptor experience. The choice of required precepting resources is at the discretion of the senior preceptor based on the resident's prior experience. Residents who have previously precepted a learner or have completed, or are completing, a teaching certificate program may have baseline knowledge of teaching and/or precepting skills; however, this will likely vary based on the timing within the residency year.

Figure 2. Application of the layered learning practice model.

Preexperience Planning

After orientation, the resident transitions to an active leadership role in preparing and planning for the rotation experience. This includes creating the student calendar, identifying clinical topic discussions, and establishing opportunities for student projects. Once the rotation materials have been finalized, the resident and senior preceptor meet to review prior to the rotation. This involves assessing for accuracy, matching the goals and objectives of the rotation to the activities on the calendar, reviewing expectations for each activity, and verifying precepting roles. If PGY1 and PGY2 residents are on rotation, the PGY2 resident develops learning activities for the PGY1 resident and the PGY1 resident is responsible for student activities.

The resident is also responsible for coordinating initial communications with students. As is traditionally expected, the incoming student will likely contact the senior preceptor prior to the rotation month; however the responsibility of addressing general rotation questions is shifted toward the precepting resident. This offers an opportunity for the resident to better transition into the primary precepting role.

Implementation

On the first day of the rotation, the senior preceptor and resident preceptor provide an orientation to the LLPM and define the responsibilities of all individuals. This promotes the perception of the resident as a preceptor from the onset of the rotation and assists in establishing the resident's authority and credibility to precept the student. Follow-up on the LLPM is conducted at least once after the initial discussion to address any questions or concerns that may arise.

The resident serves as the primary preceptor for the student throughout the rotation. This includes introducing rotation activities, establishing expectations, evaluating the learner, and providing feedback. The resident integrates the learner into direct patient care activities early, first through modeling and then coaching. The resident evaluates the student's performance and provides timely feedback on what the student is doing well and specific areas for improvement. The resident also facilitates discussions and keeps the student engaged in learning throughout the month. The resident is responsible for reporting any professional or personal concerns to the senior preceptor. The senior preceptor then guides the resident through the process of addressing the concern with the student and developing a plan for resolution focusing on the establishment of specific, feasible goals for improvement.

Throughout the learning experience, the senior preceptor maintains an active role with all learners. At the beginning of the rotation, the senior preceptor directly oversees all patient care activities, ensures the resident is achieving appropriate learning objectives, and observes the resident's precepting abilities and clinical knowledge through topic discussions and patient interactions. Once resident competency is established, the resident is often given more autonomy. The level of precepting responsibility will likely be greater with a shorter time needed to establish competency when working with residents at the end of the residency year versus the beginning or when working with a PGY2 resident. The senior preceptor is available for questions or concerns regarding clinical or teaching activities. Any graded student work or evaluation completed by the resident is reviewed by

the senior preceptor, and constructive and actionable feedback for improvement is provided. The senior preceptor is ultimately responsible for completion of all final evaluations with input from the resident. As applicable, the senior preceptor also assists the resident with delivering student feedback and provides the resident with recommendations to improve precepting skills and delivery of effective feedback.

Postexperience Evaluation

Feedback is critical for the professional development and growth of the student, resident, and senior preceptor. Weekly sessions may be scheduled to increase the specificity and timeliness of feedback delivered and received throughout the learning experience. At the conclusion of the learning experience, both the student and resident are provided with a verbal and written evaluation of their performance. Student learners are given the opportunity to provide feedback specifically on the LLPM and the performance of the resident as a preceptor. The senior preceptor discusses all feedback received directly with the resident to assist in the professional development of the resident as a preceptor. Additionally, a list of action items may be developed to improve the effectiveness of the LLPM for future learning experiences.

POTENTIAL CHALLENGES

Multiple challenges and barriers may arise with the implementation and ongoing application of the LLPM. The first challenge is scheduling complexities associated with multiple trainees. This can be mitigated by organizing all learner rotations at the site through a centralized schedule or organizational structure and utilizing this when creating resident and student rotation schedules. If the LLPM is to be implemented successfully, efforts must be made to schedule residents on the same months with students on rotations. For learners with alternative rotation lengths, a decision must be made with the preceptor and resident to determine how the resident's rotation schedule will interface with the student's. This likely will require input from the residency program director and other preceptors who may be impacted.

Another concern is the potential for inconsistent preceptor implementation, which may occur based on preceptor experience, practice setting, consistency of scheduled trainees, or availability of personnel to implement the LLPM. Preceptors new to the LLPM may have difficulty differentiating activities and expectations for each level of trainee. Additionally, if

residents or students do not have a clear understanding of the LLPM, then roles and responsibilities may overlap. These challenges highlight the opportunity that exists in orientation and preexperience planning. Preceptor development resources are shared with new senior preceptors and resident preceptors to provide background knowledge and enhance precepting skills.

Residents are also learners with varying levels of interest and competency in precepting, which are often influenced by previous teaching and clinical experiences. This may result in differences in resident ability and confidence with precepting in certain practice areas; this should alter the senior preceptor's approach to the LLPM. Additionally, if roles are not clearly delineated, students may view the resident as a peer and not respect the authority of the resident. This is more likely to occur earlier in the residency year. Thus, previous resident-specific experiences should be explored and discussed to the extent possible during the prerotation meeting. If a resident lacks competency in the clinical area, assigned background reading with a thorough explanation of expectations will prepare him or her prior to the rotation. Closer initial senior preceptor oversight is often necessary for residents with limited clinical experience or those in a highly specialized practice area until they achieve competency.

Additional challenges for the resident may include the potential for decreased individualized attention secondary to the time focused on preceptor responsibilities. Strategies to ensure optimal learning for residents with precepting responsibilities include highlighting the potential to enhance knowledge while teaching another learner and opportunities for self-directed learning. Scheduled feedback for the residents ensures they are meeting their goals for the experience.

Another potential challenge for the resident is time management. Residents must balance time they spend precepting with time needed for other longitudinal and clinical responsibilities. If the resident is struggling in this area, the senior preceptor and resident should develop a plan to ensure all obligations are completed in a timely manner. Successful implementation of the LLPM involves anticipating and overcoming these identified challenges and barriers. Additionally, our institution had support for LLPM implementation from pharmacy administration, residency program directors, and academic faculty who met with senior preceptors to discuss feedback and develop strategies to overcome challenges identified during implementation.

DISCUSSION

This descriptive practice report discusses the implementation of the LLPM within a residency program at a tertiary care academic medical center. Based on experience from implementation of this model, a 4-step process is followed to successfully accommodate the growing number of learners by increasing resident preceptorship and the availability of student learning experiences. The 4 steps of the precepting model include orientation to the LLPM, preexperience planning, implementation, and postexperience evaluations. The responsibilities of each level are described in detail as implemented at the DVAMC. Potential challenges to implementation are also identified, and strategies to overcome these barriers are presented. This report may serve to assist other programs to implement the LLPM and increase resident precepting opportunities within their institution.

The increasing number of pharmacy trainees has led to the development of alternative precepting models to include pharmacy residents. Two surveys of PGY1 residency programs within the University HealthSystem Consortium and the Veterans Health Administration (VHA) found that 85% to 90% offered precepting opportunities.^{16,17} A survey of VHA PGY2 residency programs reported 59.3% of programs offered their residents the opportunity to directly precept a PGY1 resident and 74.1% offered student precepting.¹⁸ The LLPM can serve as a tool to incorporate quality precepting opportunities and learning experiences as programs look for new ways to integrate multiple learners into the practice setting and optimize precepting experiences for residents. The LLPM has various layers and can be flexible to meet the needs of each institution. Feedback from all levels has been found to be a critical piece in quality improvement efforts as each rotation setting requires a slightly varied approach. The model can also be adapted based on how many PGY2 and/or PGY1 residents and students are simultaneously completing a rotation.¹¹

Perceived benefits of the LLPM vary based on the role one has within the model. From the senior preceptor perspective, identified benefits include maximizing the number of learners, improving efficiency, and enhancing quality assurance with multiple levels of critical review. Additionally, the senior preceptor has the opportunity to collaborate with residents and students to advance scholarship opportunities through case reports and review articles.¹⁹ For the resident, the LLPM exposes the resident to teaching experiences at different learning levels, improves leadership skills, and increases clinical and teaching autonomy and

knowledge with senior oversight.¹¹ The LLPM allows the student to experience quick immersion into direct patient care experiences and exposure to residents for professional development advice. For the health care system, even though there are currently no data to support improved patient outcomes, the LLPM may produce a more consistent pharmacy presence in areas of clinical practice and can lead to additional pharmacist interventions and improved medication reconciliation and customer satisfaction.¹²

Incorporation of the LLPM into a residency program also helps to meet various accreditation standards and recommendations. The 2015 ASHP Education and Training Policy position encourages team-based patient care between residents and students, and residents are expected to expand their roles as practitioner learners and engage in precepting roles.⁶ The LLPM allows residents to engage in precepting other residents and students to fulfill the ASHP requirement. The Pharmacy Practice Model Initiative was developed by ASHP to transform how pharmacists care for patients by maximizing the pharmacists' role in patient care teams, promoting pharmacist credentialing and training, encouraging the use of technology, and taking on a leadership role in medication usage and outcomes.²⁰ With residents sharing the precepting responsibilities through the LLPM, seasoned pharmacy clinicians may have more time to engage in patient care teams, continuing education, and scholarly activities. The American College of Clinical Pharmacy also recommends that residency programs integrate teaching experiences for residents to develop the skills needed to become competent clinicians in the practice of pharmacy.²¹ The LLPM helps residents develop leadership skills as they precept other students and participate in patient care teams. While implementation has not been quantitatively assessed at our site, feedback from residents and students is received after each learning experience and is often identified by resident preceptors as one of the most rewarding of the residency year. Feedback has also directly led to changes in our application of the LLPM, such as improving our orientation structure for learners new to this model, as well as fine-tuning the expectations assigned to each layer.

There are potential limitations to the LLPM. First, not all practice sites may be open to having residents serve as preceptors. Our institution strongly encourages resident precepting experiences, which eased the implementation of the model at our site. Additionally, the model has no data supporting the quality of learning that occurs for the resident and student with the resident assuming precepting responsibilities.

Also, no studies were identified comparing the LLPM to a more traditional precepting model evaluating other outcomes. Learning within the model relies on participation of all levels, and a breakdown in any of the levels will affect the other learners. Furthermore, the precepting experiences of senior preceptors vary and newer preceptors may find implementation more challenging. Implementation of the model may also be difficult in institutions with limited personnel to serve in the senior preceptor role. Practice sites with a variable number of students or residents may also limit implementation of the LLPM.

CONCLUSION

The increasing number of pharmacy students and residents warrants additional precepting models to address unmet training needs. The LLPM was developed to incorporate multiple learners into a clinical training environment to provide quality patient care and learning experiences. The model has the potential to provide quality precepting opportunities for residents, enhance student learning, and improve preceptor efficiency.

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