Framework and Outcomes of a Critical Care Pharmacy Visiting Clinical Professor Program

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Objectives: Experiences with utilizing a visiting clinical professor program to mentor institutions and collaborate on best practices in critical care pharmacy are described to provide a framework for these services and a synopsis of key outcomes.

Design: The Society of Critical Care Medicine Clinical Pharmacy and Pharmacology Section implemented a visiting clinical professor program to address the need for collaboration, idea-sharing, mentorship, and diffusion of innovation to clinicians in critical care practice.

Setting: Critical care pharmacy departments at 12 medical centers.

Subjects: Twelve visiting clinical professors and host institutions from 2007-2018.

Intervention: After an application is submitted to the section steering committee, an experienced clinician is paired with an institution, and a site visit is planned in collaboration with the visiting clinical professor program coordinators. The expert clinician visits the institution to share their insights and best practices based on visit goals and objectives. Reflective debriefing with both the host institution and the visiting clinical professor occurs after the visit.

Measurements and Main Results: The program has demonstrated numerous benefits including shared best practices related to critical care clinical services, expansion and refinement of care delivery models, development and optimization of research programs, and advancement of new training programs including specialty pharmacy residencies. Both the site and visiting professor find these partnerships beneficial, which has resulted in sustained success of the program over an 11-year period. Key resultant deliverables after visits have included new pharmacist positions, advancement of pharmacy services, and expanded access to academic opportunities.

Conclusions: A professional organization led visiting clinical professor program is viable, sustainable, and yields clear benefit for critical care pharmacy programs across the country. Application of this framework to other areas of pharmacy practice may be an avenue to share best practices and advance pharmacy services.

Key Words: critical care; diffusion of innovation; education; mentors; pharmacy practice; pharmacy services

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Diffusion of innovation, idea sharing, mentorship, and collaboration across institutions is challenging. The American Society of Health-System Pharmacists (ASHP) has made efforts to share insight from established pharmacists through the Visiting Leader Program, many organizations offer mentor/mentee programs to foster leadership skills, and institutions may share clinical practices through Grand Rounds speakers from within or outside the health system (1–7). Although these avenues have been provided by national pharmacy organizations, often the pharmacy profession still struggles with the challenges of sharing best practices in the areas of the Practice Advancement Initiative (PAI), optimal pharmacy roles, practice models, residency programs, leadership, and research across sites (8, 9). These existing strategies serve a broader base goal rather than targeting specialty areas such as critical care and specific system level needs. Although mentor/mentee programs are valuable, these are often focused at the individual level to promote a given practitioner's growth and career development, rather than at the systems-level to advance pharmacy services consistent with the PAI.

Individualized institutional platforms for idea sharing such as Grand Rounds programs with nationwide experts have been incorporated by medical teaching programs and societies, but are not widely present or incorporated into pharmacy specific offerings at many health systems (5–7). Current Pharmacy Grand Rounds formats at many institutions with internal speakers serve to disseminate knowledge within an institution but do not include visiting experts or address gaps in best practices that could be adapted from other practices. These systems-level gaps must be

addressed with attention to the multilevel context in which they exist. No one solution fits all centers, an individualized assessment of the need, the existing model, and the opportunities for the future need to be developed to supplement strategies such as Grand Rounds or mentor/mentee programs. Because of this need in critical care pharmacy, the Society of Critical Care Medicine Clinical Pharmacy and Pharmacology (SCCM CPP) section established the visiting clinical professor (VCP) program. We hereafter outline the framework for the VCP and describe use cases and outcomes over the last 11 years of our experience.

OVERVIEW OF THE SCCM VCP PROGRAM

The SCCM VCP program was established in 2007. The mission of the program is to leverage the expertise of senior faculty in the subspecialty discipline of critical care pharmacy to advance practice, research, and education among critical care providers. The goal of the visit is to mutually benefit the host institution and the VCP. The VCP program of SCCM aims not only to provide a visiting expert to provide an academic lecture pertinent to the site but to explore opportunities for further clinical development identified by that site. A combination of didactic teaching and application of clinical experience of processes and best practice is offered so that the hosting institution reaps the benefits on multiple platforms. The host institution gains valuable insight into expanding or innovating their current practice. The VCP shares their experience and encounters mechanisms to adapt their processes to a new environment. New professional relationships can be developed, leading to long-term collaborations.

METHODS

The VCP process is depicted in **Figure 1**. The CPP section oversees the competitive application process, pre-, during- and post-visit procedures, visit support, and follow-up. Each selected applicant is matched with a senior faculty member with expertise in area of stated need in the application. The VCP visits for 1–2 days during which they conduct an informal site assessment, share their knowledge and experience with pharmacy and medical leaders at the hosting institution, and provide guidance and recommendations for advancing critical care pharmacy.

To be considered, the applicant must complete a VCP program application and submit supporting documents which include a statement of need, visit objectives, the applicant's curriculum vitae, a letter of support from their pharmacy director, department chair, or ICU director, and a proposed itinerary for the VCP. Applicants for the program can include any pharmacist or institution looking to expand or improve critical care or emergency pharmacy services. The applicant must be a member of the CPP section of SCCM and cannot have received the award in the previous 3 years. A sample itinerary with suggested timeline, sessions, and participants is shown in **Table 1**. Applications are accepted through a rolling submission process and reviewed by the SCCM CPP section. Recipients are selected based on completeness and quality of the application, a clear need with specific objectives for the visit, a strong institutional commitment for the visit as evidenced by letter(s) of support, a clear and complete itinerary, and a demonstrated commitment to practice advancement consistent with the mission of the VCP. The SCCM supports up to two VCP visits each fiscal year and offers a stipend to cover a portion of the visiting professor's expenses. SCCM allocates resources on an annual basis to each section of the Society for member focused activities. The VCP program is funded through this resource within the CPP section. No educational grants from federal, foundation, or industry sources are used to support the program.

Customizing the purpose, itinerary, and proposed outcome of each VCP visit ensures the visit is tailored to the applicant's needs. Structured objectives and a planned lecture topic ensure the VCP is directly addressing the desired outcome. Key stakeholders and administrators involved in decision-making should be invited to host the VCP to maximize the benefit of the collaboration and provide insight on the current practice of the institution.
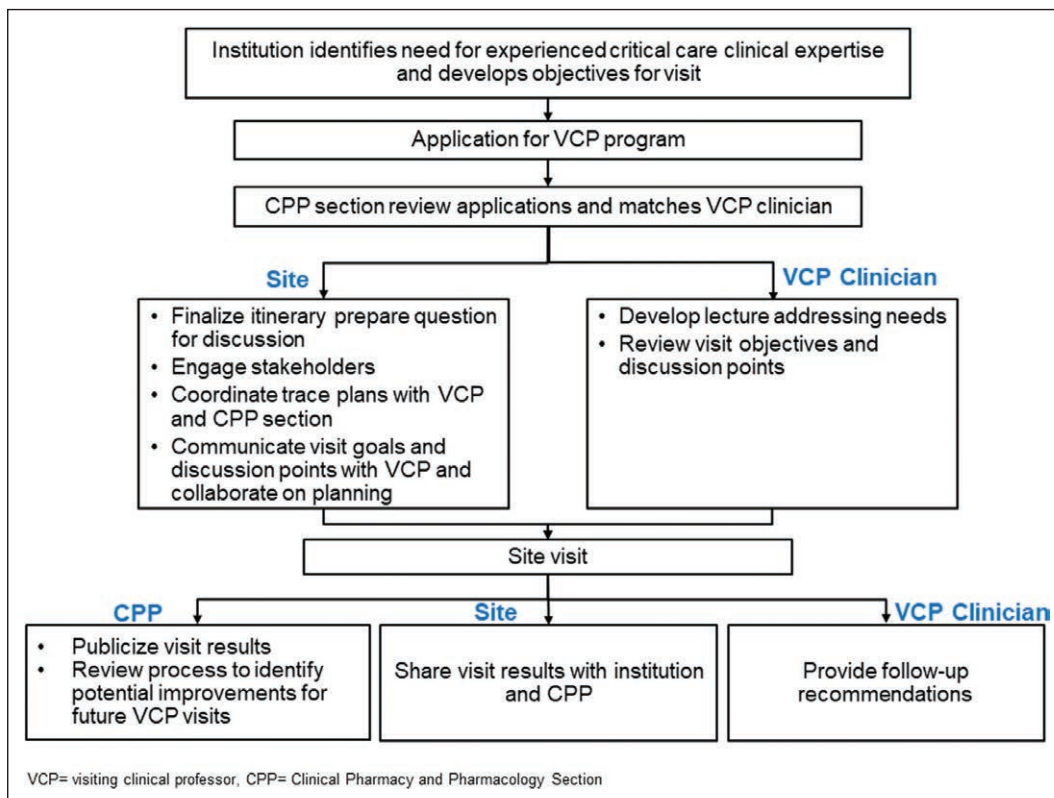

Figure 1. Visiting clinical professor (VCP) visit process. CPP = Clinical Pharmacy and Pharmacology.

TABLE 1. Sample Visiting Clinical Professor Itinerary

Time	Description	Persons Involved	Objective
08:00	Arrive at hospital	Host	Intro to day
08:30	Meet with ICU pharmacist and round with intensivist and team in ICU	ICU pharmacist and multidisciplinary team	Observe current practice
10:00	Designated time with ICU pharmacist	ICU pharmacist	Observe ICU pharmacist daily duties, discuss rounds and issues identified
11:00	Tour hospital, ICUs, and main pharmacy	Host	Observe current structure
12:00	Grand rounds/lunch	Host, ICU pharmacists, administrators	Lecture from VCP to share knowledge and best practice
13:30	Designated time with pharmacists	ICU pharmacists and pharmacy clinical leader	Discuss current practice and leader viewpoint
15:00	Designated time with administrators	Host, pharmacy clinical leader. Director of pharmacy and Chief Executive Officer, critical care leadership	Discuss current practice, future direction, and VCP recommendations

VCP = visiting clinical professor.

RESULTS

In the 11 years of the program's existence, 12 visits have occurred. Past visit focus areas and outcomes are summarized in **Table 2** and have been shared through society newsletters as a program marketing tool (10, 11).

Practice Model Optimization and Expansion

Applicants identified improvement of their current practice models through mentorship of a VCP as a goal of their site visits. Specific care improvements needed included implementation of a Code Sepsis protocol, optimizing sedation and delirium management, and advancing clinical pharmacy services in neurointensive care and emergency departments (EDs). On a broader level, collaborative networking and idea sharing to assist the recipient institution with pharmacy practice model optimization has also been an objective of several recipients.

Successful expansion of clinical pharmacy services because of VCP site visits have been observed at Seton Health in 2008, UFHealth Shands in 2010, and AdventHealth Orlando in 2013. Both UFHealth Shands and AdventHealth Orlando hosted a professor that specialized in emergency medicine and critical care clinical pharmacy practice. The VCP had successfully expanded the clinical pharmacist specialist position in the ED at his institution and written articles and delivered presentations about his involvement in reducing medication-related adverse events and cost savings in the ED (10). The goal of the VCP visit was to create a compelling clinical and business case for hospital and pharmacy administration to create an ED pharmacist role. The VCP met with key stakeholders at both recipient institutions to review costs associated with the position, build awareness of opportunities in which an ED pharmacist could be involved in improving compliance with patient core measures, improve medication safety, participate in codes, and provide services for stroke management. Areas were identified in which the ED pharmacist may contribute to decreased ED wait time, decreased ED throughput time, and overall streamlining of procedures to aid compliance and patient safety (11). As part of his review, the VCP delivered an interdisciplinary presentation regarding the ED pharmacist's critical role in multiple areas. The site visits resulted in the approval of two ED pharmacist positions for each hospital. According to site participants, the collaborative insights provided by the VCP program energized existing efforts and expanded action plans targeting improvement of ED services. In addition, the external validation of the Department's current plans accelerated the momentum for growth of clinical pharmacy in the ED. The growth had a sustained impact, as within 5 years of the visit, the AdventHealth Orlando ED has 24-hour clinical pharmacist coverage and plays a substantial role in patient care as well as order set/policy development and ED governance structures, not only at the host institution but throughout a seven-hospital enterprise.

Improving Patient Safety

Improving patient safety is a common priority in pharmacy practice and was highlighted during a VCP visit with the University of Pittsburgh Medical Center (UPMC) in 2009. Strategies to ensure safety and quality assurance after implementation of systematic prevention systems such as barcoding at the bedside and mentoring of pharmacy residents regarding pharmacist-centric patient safety were some opportunities that reaped benefits from the guidance of an experienced VCP clinician. In the years following the visit, UPMC was able to continue collaboration with their VCP and publish four manuscripts on patient safety initiatives (12–15). There is opportunity to use the program at other visits for similar safety goals such as optimization of critical care medication use systems, drug information services, staff education, distribution systems, patient education, and work environments.

Advancement of Pharmacy Research

Scholarly activities such as research contribute to practice model improvements but can face barriers to integration into practice (5). The VCP program is often used to provide guidance on research best practices and collaboration. This was the goal of VCP visits to

TABLE 2. History of Visiting Clinical Professor Visits and Objectives

Year	Hospital Site	Visit Objectives
2017	Mayo Clinic	Isolate and mitigate barriers to implementation of a robust research program
		Provide tools to facilitate development of pharmacy staff research knowledge
2016	Cape Fear Valley	Assess ICU clinical services and practice models
		Review ICU Liberation campaign
2014	Vidant Medical Center	Review alternate strategies to optimize ICU practice models
		Review sepsis response models
2013	AdventHealth Orlando	Grow clinical services in the ED
		Anticipate challenges of a new clinical ED program and explore potential solutions
2010	DCH Regional Medical Center	Optimize clinical practice model in an open ICU
2010	UFHealth Shands	Define optimal role and scope of pharmacy in the ED
		Grow clinical services and resident training in the ED
2009	University of Pittsburgh Medical Center	Discuss prevention systems implemented at another institution for patient safety and strategies for successful implementation of suggested systematic changes at bedside
		Discuss opportunities for future research and grants
		Mentor pharmacy residents regarding pharmacist-centric patient safety
2009	Yale-New Haven Hospital	Optimize current practice model and expansion of clinical pharmacy services
2008	Seton Health Network, Williamson County	Optimize current practice model and expansion of clinical pharmacy services
2008	University of Virginia	Define optimal role and scope of pharmacy in the ED
		Share potential deliverables of an ED pharmacist
		Explore ED to ICU transitions and the role of pharmacy
2007	Virginia Commonwealth Medical Center	Mentor pharmacists on expanding role in research and explore opportunities for research collaboration
		Optimize residency program and practice model
		Compare best practices in sedation and delirium management
2007	Johns Hopkins Medical Center	Exchange insight/ideas as it relates to drug therapy and clinical pharmacy practice in a neurointensive care setting
		Exchange research ideas/agendas to foster collaboration
		Learn strategies for career and research development

ED = emergency department.

Johns Hopkins Medical Institution and Virginia Commonwealth Medical Center in 2007, as well as Mayo Clinic in 2017. An identified barrier to overcome was project advisors' lack of dedicated time to research. Other topics discussed in the visit to Mayo Clinic included mechanisms to secure extramural funding for pharmacist research, metrics to benchmark pharmacist training and productivity, and integrating research into the pharmacist workflow in a clinical environment. In response to the visit, the Mayo Clinic research program revisited its priorities and narrowed their focus. They now focus on enhancing the visibility of the Department of Pharmacy as academic pharmacist scientists, optimizing pharmacist candidacy for research awards both through skill building and strategic alliances, and securing dedicated time for research to facilitate incorporation into the pharmacist workflow. Mayo Clinic saw an increase in pharmacy departmental publications from 46 and 51 the 2 years prior to their VCP visit to 60 and 76 in the 2 years following their visit. Cape Fear Valley hospital used recommendations from their VCP visit to conduct and publish research evaluating the impact of an additional ICU pharmacist on clinical activities and team member satisfaction. These authors were also a part of publishing results of the ICU liberation campaign, which was focused on during their VCP visit, as another indicator of the sustainable impact of the program on research and publication activities (16, 17).

Education Improvements

The VCP program has served as a venue for sharing of residency program and educational best practices. A visit at Virginia

Commonwealth allowed the host institution's pharmacists to personally hear about how a different pharmacy residency program balances a busy research and patient care program. They examined program details to identify opportunities to improve efficiency and productivity throughout each year. Teaching strategies were shared in the framework of integrating teaching and education into pharmacy practice and patient care activities. Although past visits have focused on improving existing programs, institutions interested in starting new residency programs could also use the VCP Program to review residency program plans and mentor staff on important aspects of precepting and building a successful residency training program.

Summary

These VCP visits were mutually beneficial. Not only did the host institution obtain essential guidance in an area they identified as a critical need, but also the VCP was provided an opportunity to share past experiences and lessons learned. VCPs were challenged to explore new modalities and adapt their experiences to a unique environment with different needs, patient populations, and practitioners. They were also able to take aspects of the recipient program back to share with their own center. Visits also facilitate long-lasting, rewarding, and collaborative relationship(s) between the visiting professor and recipient. These shared benefits for both the practice site and the VCP ensure sustainability for the program into the future by rewarding participation of accomplished clinicians.

CHALLENGES AND KEYS TO SUCCESS

The main challenge the program has faced through the years is a lack of awareness about the program and its potential benefits. Advertising of the VCP program is conducted through CPP newsletters, flyers, journal clubs, local SCCM chapter meetings, critical care pharmacy list-servs, and national pharmacy meetings such as ASHP Midyear. Publicizing the program and its successes remains a vital component to its continuation and benefit for more critical care pharmacy providers. Sustaining the lessons learned at the recipient institution in years after the VCP visit is another challenge. Finally, the visit can be less meaningful if VCP's are unclear of the objectives of the visit and if pharmacy staff has insufficient time to dedicate to the visit. Without the stipend provided by SCCM to support up to two VCP visits annually, the program would be less likely to succeed.

To overcome these challenges and have a successful VCP site visit, preparation and communication on the part of the hosting institution is extremely important. Objectives of the visit should be clearly communicated to the VCP, along with the current state of the practice site, the audience, and potential discussion points or questions, preferably in advance to promote efficiency during the visit. The professor should be notified of deadlines for presentation slides or other requirements for the site. Arrangement for meeting with appropriate stakeholders and provision of an itinerary is recommended in preparation for the visit. The VCP subcommittee of CPP is available

TABLE 3. Checklist for Hosting Institution

Key VCP Activities
Pre-visit
Identify an institution need that may benefit from a VCP
Complete and submit the VCP program application including visit objectives
Obtain administration support for the visit from a pharmacy director, department chair, or ICU director
Provide a proposed itinerary for the VCP
Contact VCP sponsor (if needed) for guidance on application preparation
Once VCP is assigned, communicate to provide site background information, visit objectives, potential discussion points, and answer questions
During visit
Follow the planned itinerary
Review site background information and practice model with VCP
Ensure discussion points from initial visit objectives are addressed
Engage team members and stakeholders with the VCP
Review strategic plan with administrators
Record sessions (as able) to share post-visit with other institutions facing similar challenges
Post-visit
Within 2 wk of completed visit, provide a written description of the experience to the VCP sponsor
Complete a debriefing session with the VCP and program sponsors to identify strengths and areas for improvement with the experience
Present experience at an outside forum (such as clinical meeting) and share recorded sessions to share lessons learned that may benefit other institutions and advance pharmacy practices

VCP = visiting clinical professor.

as a resource to assist with guidance on optimizing the visit. See **Table 3** for a checklist to ensure a successful experience. Following the visit, the applicant provides a summary of the visit to the CPP section and shares insights from the experience through a newsletter article and speaking engagement at the SCCM Annual Congress to spread awareness, share successes, and promote idea sharing.

FUTURE APPLICATION

This program can likely be expanded to include other objectives such as optimizing technology, pharmacist credentialing and privileging, and residency program and student teaching best practices. Currently, the VCP and recipient institution primarily benefit from this program. However, many institutions are likely to benefit from knowledge gained, and ways to share knowledge from the VCP's with a wider audience need to be explored. An international audience in countries that do not currently incorporate critical care pharmacy services may see benefit from participation, and this avenue is being explored through development of an international VCP proposal. Potential platforms to expand the program reach include recording and sharing sessions from the visit on social media or developing VCP lectures into continuing education for multiple disciplines that can be shared globally. Virtual VCP visits may enable consultation on real-time issues, such as pandemic response, which was recently applied in the severe acute respiratory distress syndrome coronavirus 2 pandemic to enable multiple VCP's to share info across multiple institutions. It is likely that specialty sections within SCCM or other professional organizations in different practice areas would be able to replicate similar programs and may be especially beneficial in nonacademic hospitals or rural settings with more limited academic resources.

CONCLUSIONS

The VCP program is a collaborative approach to advancing critical care pharmacy services through connecting renowned clinical professors with institutions in need of model optimization, expansion of services, research development, improvement of patient safety, or endless other opportunities. Results from the program have translated into sustained practice improvements at participating institutions. Applying a similar strategy throughout other specialties within and beyond pharmacy may be an option to further expand the reach of these programs.

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REFERENCES

1. Hammond DA, Holt TR, Harris SA, et al: Perceptions of critical care pharmacists participating in a formal mentor-mentee program. *Am J Health Syst Pharm* 2018; 75:1691–1693

2. Personett HA, Hammond DA, Frazee EN, et al: Road map for research training in the residency learning experience. *J Pharm Pract* 2018; 31:489–496

3. American Society of Health-System Pharmacists: ASHP Foundation Visiting Leaders Program. Bethesda, MD, 2020. Available at: www.ashpfoundation.org/leadership-development/ visiting-leaders-program. Accessed November 18, 2018

4. Girnys JP, Cho JC, Ivey MF: ASHP foundation's visiting leaders program. *Am J Health Syst Pharm* 2015; 72:1441–1443

5. Tridandapani S, Mullins ME, Meltzer CC: Grand rounds and a visiting professorship program in a department of radiology: How we do it. *Acad Radiol* 2012; 19:1415–1420

6. Southern Society for Clinical Investigation: Visiting Professor Program. 2020. Available at: https://www.ssciweb.org/visiting-professor-program.php. Accessed May 4, 2020

7. American Society for Dermatologic Surgery: Educational Exchange and Mentorship Visiting Professor Guidelines for Visit. 2020. Available at: https://www.asds.net/Portals/0/PDF/visiting-professor-guidelines.pdf. Accessed May 4, 2020

8. The consensus of the pharmacy practice model summit. *Am J Health-Syst Pharm* 2011; 68:1148–1152

9. Rudis MI, Brandl KM: Position paper on critical care pharmacy services. Society of Critical Care Medicine and American College of Clinical Pharmacy Task Force on Critical Care Pharmacy Services. *Crit Care Med* 2000; 28:3746–3750

10. Nei SD: Visiting clinical professor spotlight. *Clin Pharm Pharmacol Sect Newsletter* 2018; 18:6–7

11. Hodgman T: Visiting clinical professor spotlight. *Clin Pharm Pharmacol Sect Newsletter* 2012; 12:12–13

12. Kane-Gill SL, Jacobi J, Rothschild JM: Adverse drug events in intensive care units: Risk factors, impact, and the role of team care. *Crit Care Med* 2010; 38:S83–S89

13. Kane-Gill SL, Kirisci L, Verrico MM, et al: Analysis of risk factors for adverse drug events in critically ill patients*. *Crit Care Med* 2012; 40:823–828

14. Kane-Gill SL, O'Connor MF, Rothschild JM, et al: Technologic distractions (part 1): Summary of approaches to manage alert quantity with intent to reduce alert fatigue and suggestions for alert fatigue metrics. *Crit Care Med* 2017; 45:1481–1488

15. Winters BD, Cvach MM, Bonafide CP, et al; Society for Critical Care Medicine Alarm and Alert Fatigue Task Force: Technological distractions (part 2): A summary of approaches to manage clinical alarms with intent to reduce alarm fatigue. *Crit Care Med* 2018; 46:130–137

16. McDaniel J, Bass L, Pate T, et al: Doubling pharmacist coverage in the intensive care unit: Impact on the pharmacists' clinical activities and team members' satisfaction. *Hosp Pharm* 2017; 52:564–569

17. Pun BT, Balas MC, Barnes-Daly MA, et al: Caring for critically ill patients with the ABCDEF bundle: Results of the ICU Liberation collaborative in over 15,000 adults. *Crit Care Med* 2019; 47:3–14