

Characterization of Inpatient Pharmacist Practice in Wisconsin

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Abstract

Objectives: To describe the practice of inpatient pharmacists in the state of Wisconsin.

Methods: A web-based survey administered via Qualtrics® was emailed to 839 hospital pharmacists in Wisconsin.

Results: There were 364 (43%) respondents to the survey. Respondents' most common areas of practice included acute care (71%), central pharmacy (65%), critical care (47%), and emergency room (28%). These were the primary areas of practice for 39%, 9%, 11%, and 2% of respondents, respectively. Most respondents (55%) practiced in hospitals containing over 250 beds and had on average 34 pharmacists on staff. Many reported completion of post-graduate training (42% PGY-1, 12% PGY-2) and board certification (33%). Most participate in teaching (89% students, 55% residents). The following percentages of respondents reported providing these services some of the time: clinical monitoring (77%), order verification (76%), pharmacist consults (76%), precepting (74%), and medication reconciliation (72%). Even the least frequently selected services were provided by approximately half of pharmacists: product preparation (51%), administration/operations (44%), and clinical coordination/drug policy (44%).

Conclusions: Inpatient pharmacists pursue post-graduate training and certification and contribute to the education of students and residents. Wisconsin inpatient pharmacy practice is focused on clinical services and still includes administrative and dispensing tasks.

Inpatient pharmacy provides a unique practice setting for pharmacists, with various roles and responsibilities which have evolved over time.¹ The education and training of inpatient pharmacists have also evolved since the practice of clinical pharmacy was first developed in the mid-1960s. Pharmacy practice has advanced over the years to expect pharmacists to capitalize on their specialized pharmacotherapeutic knowledge and advanced training in order to improve patient outcomes while continuing to supervise drug distribution services.^{1,2}

The importance of inpatient pharmacists has been well-documented in the literature. Multiple studies have documented the value pharmacists can provide in improving patient outcomes, preventing medication errors, and reducing healthcare cost.²⁻⁸ These findings were echoed in the 2014 American Academy of Colleges of Pharmacy (AACCP) white paper on direct patient care which stated, "Clinical pharmacists focus on identifying, resolving, and preventing medication-related problems; improving medication use; and optimizing patients' pharmacotherapeutic outcomes. However, their approach to patient care can vary greatly."⁹

Results from the American Society of Health-System Pharmacists (ASHP) national surveys on hospital pharmacy practice help to characterize the practice of clinical pharmacy within the inpatient setting. The national surveys are organized according to six components of the medication-use system, and focus on two components each year: prescribing/transcribing (2013), dispensing/administration (2014), monitoring/patient education (2012).¹⁰⁻¹² These surveys have demonstrated that inpatient pharmacists are increasing their role in providing clinical services related to patient monitoring and transitions of care as well

as prospective order review, among other items (Table 1).

The education and training of clinical pharmacists has grown in tandem with the expanding roles and services of inpatient pharmacists. In 1962, ASHP established a formal accreditation process for the postdoctoral residency training that had been available since the 1930s.² Residencies are offered as postgraduate year one (PGY1) pharmacy residencies in general pharmacy practice, and postgraduate year two (PGY2) pharmacy residencies in advanced specialty training. In 2016, there were 1,045 PGY-1 programs (not including community and managed care) offering 2,920 positions, of which most were filled through phase I of the match.¹³ This represents approximately 24% of pharmacy graduates participating in PGY1 training.

The growth of clinical training has also been evident by the growth of board certification under the Board of Pharmaceutical Specialties (BPS). BPS was created in 1976 with a stated goal "to improve health through recognition and promotion of specialized training, knowledge, and skills in pharmacy, and board certification of pharmacists."² The BPS currently recognizes eight pharmacy specialties: ambulatory care, critical care, nuclear, nutrition support, oncology, pediatrics, pharmacotherapy, and psychiatrics. The number of board-certified pharmacists has more than quadrupled in the past decade, from 5,054 in 2005 to over 21,000 today.¹⁴

Although information has been published regarding the national trends in inpatient pharmacy practice and training, to date, the demographics and scope of practice of Wisconsin inpatient pharmacists have yet to be described. The aim of this survey was to better characterize the education, training, and practice of inpatient pharmacists in Wisconsin.

Methods

A cross-sectional survey of a sampling of hospital pharmacists in Wisconsin was conducted. A 15-item electronic (Qualtrics®, Provo, UT) survey tool was created by the authors and pilot tested by small group of hospital preceptors and Concordia University Wisconsin School of Pharmacy (CUW SOP) faculty members with inpatient practice experience. The survey instrument was then distributed via email to 839 pharmacists during the fall of 2014. The pharmacists were selected via self-identification as hospital pharmacists through a combination of a database of experiential preceptors through CUW SOP and through the Pharmacy Society of Wisconsin's membership directory. Participants were given five weeks to complete the survey and two reminder emails were sent during this timeframe. All survey results were anonymous and the opportunity to enroll in a drawing for \$50 gift cards was offered as an incentive for completion. The study was approved as exempt by the CUW IRB committee. Data was analyzed using descriptive statistics.

Results

A total of 364 surveys (43%) were completed. On average, respondents had been licensed pharmacists for 14 years with a median of 8 years. The overall size of the institution in which the respondents practice varied widely. (Table 2)

A significant number of respondents have completed at least a PGY-1 pharmacy residency (42%) with 12% completing a PGY-2 pharmacy specialty residency. Only 2% of respondents reported completing fellowship training. Thirty three percent have achieved some form of board certification. (Table 2)

The majority of respondents participate in training of either pharmacy students or pharmacy residents. Eighty-nine percent of respondents report participating in the teaching of pharmacy students. In comparison, only 55% of pharmacists participate in resident teaching.

The following percentages of respondents reported providing these services some of the time: clinical monitoring (77%), order verification (76%), pharmacist consults (76%),

TABLE 1. Results From the ASHP National Surveys on Hospital Pharmacy Practice¹⁰⁻¹²

| | |
|--|---|
| Prescribing and Transcribing (2013) | <ul style="list-style-type: none"> Therapeutic interchange policies were used in 87.2% of hospitals, and pharmacist consultation to improve prescribing was common. Pharmacists most commonly provided consultations to prescribers for dosage adjustment (98.3%), drug information (93.2%), recommendations for antibiotic therapy (91.7%), and pharmacokinetics (91.5%). |
| Dispensing and Administration (2014) | <ul style="list-style-type: none"> Pharmacists reviewed and approved all medication orders before the first dose was administered, either onsite or by remote order view, except in procedure areas and emergency situations, in 81.2% of hospitals. Discharge prescription services increased from 11.8% of hospitals in 2012 to 21.5% in 2014. |
| Monitoring and Patient Education (2012) | <ul style="list-style-type: none"> The rate of pharmacist monitoring of most patients (i.e. >75%) in hospitals increased from 20.3% in 2000 to 46.5% in 2012. Therapeutic drug monitoring programs are in place at most hospitals; at more than 80% of hospitals, pharmacists have the authority to order laboratory tests and adjust medication dosages. At most hospitals, nurses are primarily responsible for medication reconciliation, but 65.9% of pharmacy directors would like pharmacy to have this responsibility. |

precepting (74%), and medication reconciliation (72%). Even the least frequently selected services were provided by approximately half of pharmacists: product preparation (51%), administration/operations (44%), and clinical coordination/drug policy (44%) (Figure 1).

The majority of respondents reported providing care for adult (98%) and geriatric-aged (93%) patients, although not exclusively. Many pharmacists reported providing care for adolescent (55%), children (50%), infants (46%) and neonatal-aged patients (48%) as well. The majority of respondents do not maintain

a particular specialty of practice (e.g. cardiology, medicine, etc.) (Figure 2).

Discussion

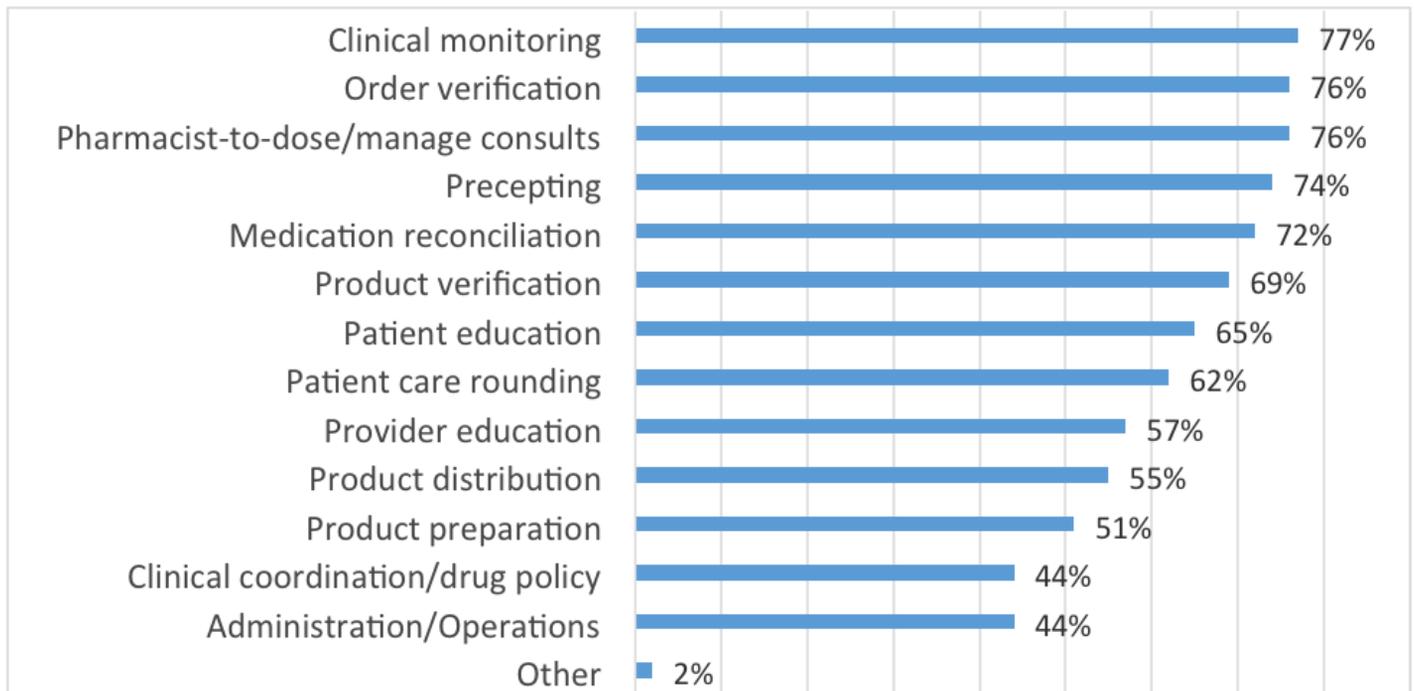
Over 70% of respondents indicated that at least some of their time was spent caring for acutely ill patients; therefore, the survey results provide us with good insight into the demographic makeup and current practice of hospital pharmacists in Wisconsin. Many of the hospital pharmacists surveyed have completed post graduate training and/or certifications and the vast majority participate in the education of students and residents.

With advances in automation,

TABLE 2. Demographics

| <i>Demographics</i> | |
|--|------------------|
| Average Years of Pharmacist Licensure | 14 (median 8) |
| Number with Post-graduate Training/Certification (%) | |
| PGY1 Residency | 153 (42) |
| PGY2 Specialized Residency | 42 (12) |
| Fellowship | 8 (2) |
| Board Certification | 121 (33) |
| Number that participate in teaching of pharmacy students (%) | 324 (89) |
| Number that participate in teaching of pharmacy residents (%) | 201 (55) |
| Number of respondents by number of licensed Hospital Beds at Practice Site (%) | |
| < 25 | 12 (3) |
| 25-50 | 27 (7) |
| 51-100 | 34 (9) |
| 101-250 | 90 (25) |
| 251-500 | 89 (24) |
| > 500 | 112 (31) |
| Average number of pharmacists employed at practice site | 34 (median 20.5) |

FIGURE 1. Percentages of Respondents Providing Specific Pharmacy Services Some of the Time



streamlining of distribution processes, and the advancing of the pharmacy technician role in dispensing, pharmacists are now spending more time on clinical tasks. Results from the most recent ASHP national survey on hospital pharmacy practice for monitoring and patient education completed in 2012 indicated that almost half of hospitals have pharmacists monitor 75% or more of patients and nearly 95% of hospitals have pharmacists participating in therapeutic drug monitoring.¹⁰ The 2014 ASHP survey focused on dispensing and administration.¹² Nearly two-thirds of hospitals surveyed report utilizing some form of automated dispensing technology. These findings are consistent with our results indicating that pharmacists are spending less time on dispensing-related tasks such as product preparation and product dispensing. Hospital pharmacists in Wisconsin are spending most of their time completing clinical functions, such as clinical monitoring, order verification and pharmacist consults.

Although our survey indicates that less time is spent on dispensing related tasks, most respondents indicated participating in product preparation, verification and distribution at least some of the time. This indicates that there is still room to

grow in optimizing technician services, particularly as it relates to product preparation and distribution. Expanding the pharmacy technician role is an active area of research.^{15,16} Continuing to delegate appropriate tasks to appropriately trained technicians can help continue the trend of moving pharmacists from dispensing roles to fulfill more clinical tasks.

The increasing clinical role of pharmacists has implications on the education and training of pharmacy students and residents. There has been some debate in the literature related to the practice-readiness of pharmacy school graduates and the need for additional post-graduate training to provide direct patient care as a clinical pharmacist.^{17,18} The Accreditation Council of Pharmacy Education (ACPE) expects that schools of pharmacy prepare pharmacy graduates that are able to provide direct patient care in a variety of health care settings.¹⁹ However, ACCP and ASHP have guidelines and best practice statements indicating that pharmacists in direct patient care roles require additional training.^{9,20} Given the current shortage of residency positions nationwide, it is important that schools continue to prepare pharmacy graduates with the skills and knowledge to succeed in the ever evolving practice of clinical

pharmacy.

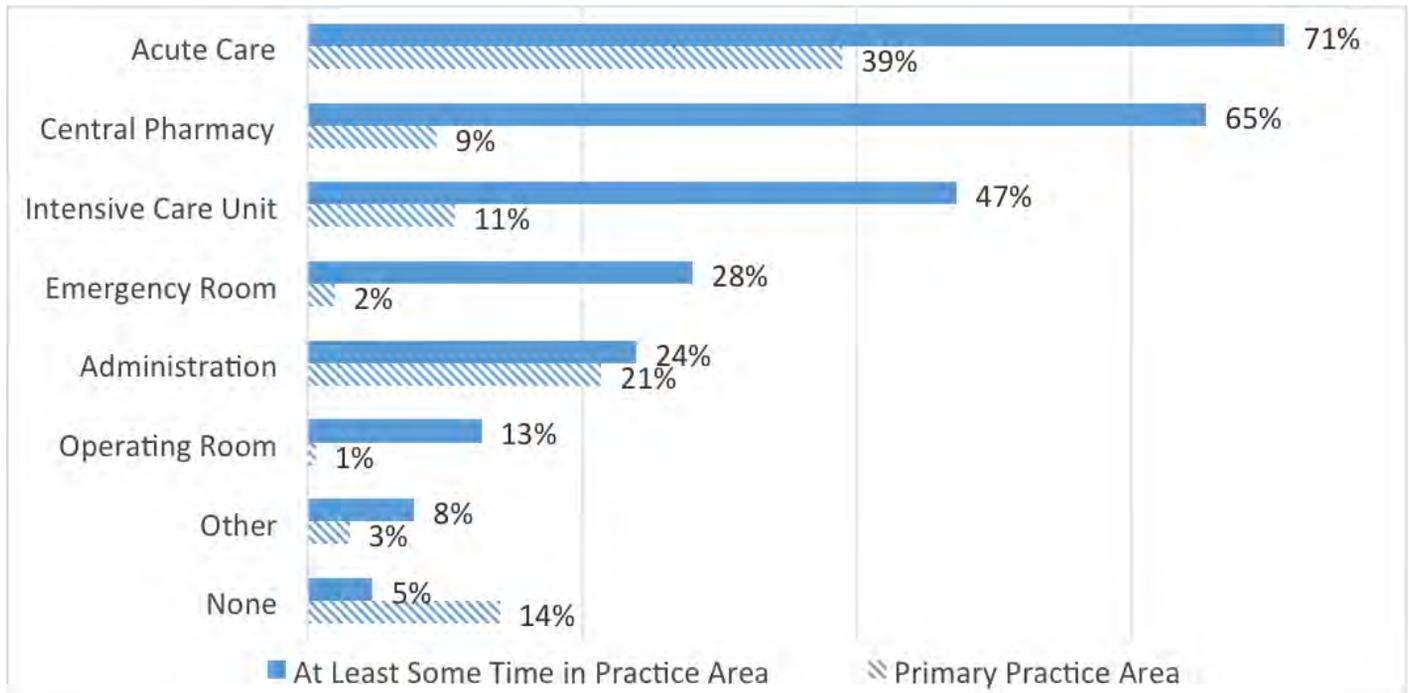
Limitations

There are several limitations to this study to note. Although the response rate for this survey is good compared with the ASHP national survey of hospital pharmacy practice, which has averaged around 30% over the past 3 years,¹⁰⁻¹² our data is still limited by the number of respondents. Also, there was a distribution of responses from hospitals of various sizes, but the vast majority of our respondents practice at hospitals with at least 100 patient beds. Therefore, practice at smaller hospitals may be underrepresented in our results.

The lack of geographic data is also a limitation. Because this information was not collected, it is unknown whether or not our findings are only limited to certain regions of the state. Also, because those surveyed included only CUW SOP hospital preceptors and/or PSW members, hospital pharmacists not currently members of PSW or a registered preceptor with CUW were not given an opportunity to respond. Since the majority of our respondents serve as experiential preceptors, it is not clear how the results would apply to hospital pharmacists that are not preceptors.

Conclusion

FIGURE 2. Respondent Practice Areas



Wisconsin hospital pharmacists pursue post-graduate training and certification and contribute to the education of students and residents. Wisconsin inpatient pharmacy practice is focused on clinical services and still includes administrative and dispensing tasks. Future work could focus on identifying optimal use of pharmacy technicians for preparation and dispensing tasks to further allow for implementation of clinical pharmacy services. ●

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