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Compass Rose™ Implementation in a Large Academic Medical Center

Selina Somani *, Shannan Takhar, Derek Miller, Hana Camarillo, Mency Zhu, Kathie Tran

University of California, Davis Health Department of Pharmacy, Sacramento, CA, United States of America

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ABSTRACT

Background: Compass Rose™, a case management tool developed by Epic®, was designed to track various patient coordination tasks, outreaches, and outcomes. This report describes the implementation of Compass Rose™ within an internal health-system specialty pharmacy (HSSP) and changes in care coordination metrics before and after implementation. To the best of our knowledge, this is the first study of its kind to discuss the implementation of Compass Rose™.

Objectives: The goals of this study were to describe the implementation process of Compass Rose™ at an internal HSSP and compare staff satisfaction before and after Compass Rose™ as the primary outcome.

Methods: This was an Institutional Review Board exempt, retrospective cohort study conducted between June 2022 to December 2022 that assessed staff satisfaction, refill documentation time, prescription turnaround time, and patient satisfaction pre- and post- Compass Rose™ implementation through survey administration, observed time studies, and internal data reports. The process of Compass Rose™ implementation was also described and discussed.

Results: 24 specialty pharmacy staff members participated in the Compass Rose™ implementation survey. No statistically significant differences were observed in either staff satisfaction (3.96 ± 0.95 versus 3.70 ± 0.69, $p = 0.29$) or predicted versus actual challenge of implementation (3.67 ± 1.17 versus 3.09 ± 0.96, $p = 0.064$). There was no significant difference in refill documentation time pre- versus post- Compass Rose™ implementation (4.22 ± 3.15 minutes versus 4.10 ± 2.36 minutes, $p = 0.82$); however, there was a statistically significant increase in prescription turnaround time post implementation (2.59 ± 2.85 days versus 2.69 ± 2.35 days, $p = 0.002$).

Conclusion: Compass Rose™ implementation had no significant impact on staff satisfaction, patient satisfaction, or overall refill documentation time. Prescription turnaround time increased, which could be due to significant workflow changes with Compass Rose™ or several other contributing factors such as increased prescription volume and training new staff during this period.

Benefits of Compass Rose™ included standardization of workflow, ability to quantify staff performance and clinical impact, and increased transparency regarding care provided by the specialty pharmacy team.

1. Introduction

Specialty medications, defined as high-cost medications that treat rare and/or chronic conditions, account for only 2% of all prescription drugs used by Americans.[1,2] However, $217 billion was spent on specialty medications alone in the year 2018, which comprised of 45.7% of total drug expenditures.[2] There continues to be a steady pipeline of high-cost drugs coming to the market, adding to the burden on the healthcare system to ensure appropriate prescribing, dispensing, and monitoring of these medications. Growing evidence continues to emphasize the importance of the pharmacist's role in the management of specialty medications for patient safety and outcomes.[3]

Since 2010, the University of California Davis (UC Davis) Specialty Pharmacy has grown to deliver comprehensive clinical services to 14 different specialty therapeutic areas throughout the Greater Sacramento, California region. These areas include allergy, cardiology, dermatology, endocrinology, gastroenterology, hepatology, infectious diseases, movement disorders, nephrology, neurology, oncology, pulmonology, rheumatology, and solid organ transplant.

Additionally, the specialty enterprise has expanded its services to two dispensing pharmacy facilities with over 75 staff members. The specialty staff provide clinical services which include comprehensive

* Corresponding author at: University of California Davis Health, Department of Pharmacy, 2315 Stockton Boulevard, Sacramento, CA 95817, United States of America.

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clinical pharmacist therapy management, patient education, prior authorization and appeal coordination, medication cost assistance, and refill assistance. Health system specialty pharmacies uniquely provide frequent and extensive patient care that requires follow-up throughout the patient's entire clinical course and documentation of these efforts in the electronic medical record (EMR).[3] UC Davis Specialty Pharmacy has been accredited by the Utilization Review Accreditation Commission (URAC) since 2017. This accreditation requires specialty pharmacies to implement best practices which include interval clinical assessments while on treatment.[4] UC Davis identified a system that could assist with coordinating patient care tasks and ensuring compliance with URAC standards. All specialty service lines utilized a Microsoft Excel® spreadsheet as a patient management tool to track and coordinate the timing of patient care activities. This patient management spreadsheet was stored on a secure cloud-based server and was used to track all tasks including, but not limited to, clinical assessments, lab monitoring, medication access tasks, and refill coordination. The patient management spreadsheet was accessible by specialty pharmacy staff but was not located in the EMR. Microsoft Excel® was useful for consolidating pertinent patient information and allowed for quick documentation and edits outside of the EMR. However, this method was prone to errors including unintentional deletions, frequent program crashing due to large data sets, as well as lack of inter- and intradepartmental standardization. Additionally, the Excel® program required manual productivity and outcome tracking.

The UC Davis Department of Specialty Pharmacy desired a case management tool that could be integrated within the Epic® EMR. UC Davis Specialty Pharmacy implemented Compass Rose™ to fill this gap. Compass Rose™ is a case management tool developed by Epic®. Compass Rose™ is integrated into Epic ® EMR and is a task driven program that organizes patients based on level of priority and outreach type. Additionally, this application better tracks staff productivity through the completion of tasks, as well as pharmacist interventions and patient outcomes. This report describes the process of Compass Rose™ implementation within an integrated health-system specialty pharmacy, and reports changes in care coordination metrics before and after implementation.

2. Methods

The primary outcome for this study was staff satisfaction before and after Compass Rose™ implementation. Secondary outcomes included differences in predicted versus actual challenges of module implementation, change in prescription turnaround time (TAT), refill documentation time, number of incoming patient phone calls per patient, and patient satisfaction. This report was defined as quality improvement research that was exempt from institutional review.

Qualitative survey responses were collected pre- and post-implementation of Compass Rose™. Staff satisfaction was measured via a survey that was sent out to the entire specialty pharmacy team ($n = 74$) prior to Compass Rose™ implementation in June 2022 as well as six months post-implementation in December of 2022. The survey instrument was drafted by a team of specialty pharmacists and analysts, reviewed by key stakeholders on the specialty pharmacy leadership team, and piloted by a pharmacy resident prior to distribution. The survey was distributed via email to the specialty pharmacy staff and three completion reminders were sent as follow-up. Additionally, the data was paired between the pre and post groups. Survey questions are displayed in Fig. 1. Refill documentation time was obtained via a direct observation time study pre-implementation in June of 2022 and post-implementation in December of 2022. Time was recorded from initiation of refill task and stopped when the staff member finished their documentation on 10 separate refill calls. Time for each refill call was documented pre- and post- Compass Rose™ implementation for five different specialty clinics. These clinics were chosen due to prescription volume and complexity of patient care coordination: gastroenterology, infectious disease, oncology, pulmonology, and solid organ transplant. One pharmacy technician from each clinic was observed and the average time for 10 refill calls was then recorded. The number of incoming patient phone calls was collected via our metric tracking software in Tableau®. TAT was defined as the time from when a prescription was sent to our dispensing pharmacies to the medication being ready to dispense (in hours) and was pulled via Epic® query. Data for the number of incoming calls and TAT was collected for a period of four months surrounding pre-implementation and post-implementation time points (March 2022 to July 2022 for pre-implementation and November 2022 to March 2023 for post-implementation). Patient satisfaction data were pulled from National Association of Specialty Pharmacy (NASP) reports. A two-sided Student's *t*-test was used for a comparison of means for quantitative data including staff satisfaction, challenge of implementation, refill documentation time, TAT, and patient satisfaction, due to the exploratory and comparative nature of the study. Pre- and post-implementation averages were compared between subjects with each cohort consisting of the same specialty pharmacy staff members.

3. Case study report

3.1. Pre-implementation

The implementation team consisted of Epic® implementation coordinators, an Epic® analyst focused on specialty pharmacy, supervisors and managers within specialty pharmacy, project analysts, and pharmacists and pharmacy technicians who were designated as smart end users (SMEs) to be content matter experts.

The Epic® coordinators used their own implementation methodology to create a project timeline. Planning for Compass Rose™ implementation started with weekly meetings about six months prior to the implementation date. Demonstrations were provided to prepare the

Category	Question
Demographics	Name
	Specialty Clinic
	Role (Pharmacist/Technician)
Staff Satisfaction	On a scale of 1-5, how satisfied are you with the current patient management tool? (1= very dissatisfied, 5= very satisfied)
	Please explain your reasoning
	What issues/challenges are you experiencing with the current patient management tool?
Implementation Challenges	On a scale of 1-5, how challenging will be/was Compass Rose™ implementation? (1= not challenging, 5= extremely challenging)
	Please explain your reasoning

Fig. 1. List of Survey Questions Investigating Staff Satisfaction with Compass Rose™ Implementation. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

team for what to expect. There were also weekly group meetings amongst the SMEs to review best practices on what can be applied to the whole department. A compilation of pharmacy services and their workflows were assessed in each specialty clinic and then consolidated to create a standardized workflow. Relevant data were transferred from the legacy patient management spreadsheets to fit the Compass Rose™ case management requirements. This required the legacy Excel® files to be reformatted to highlight only relevant information needed to be copied over to Compass Rose™ so that the data were imported correctly. The quantity of imported data varied. During each import, the data required validation from current staff members to ensure the information was correct. Items for completion were tracked using project management software.

A small sample of pharmacy staff had the opportunity to review the Compass Rose™ module during the Epic® "validation" phase. This was used to visualize what the module would look like without impacting patient care. Additionally, there were in-services held by SMEs with each clinical area to demonstrate and introduce the Compass Rose™ program for those who did not have validation access.

The SMEs and project team worked with Epic's ® and Information Technology (IT) Education staff to create educational items which were distributed three months in advance. Pharmacy staff were required to attend training two weeks before implementation to practice using Compass Rose™ functionalities in a test environment.

3.2. Implementation

There was a planned two-week data lag that prevented immediate utilization of Compass Rose™ alone. This was because the data that were transferred needed to be verified by staff to be accurate and appropriate for transfer. Staff continued to use the legacy workflow to ensure patient care was not disrupted during the transitional period and there was no loss of data. Each specialty clinic initially developed individual Compass Rose™ transition plans. There was not a pre-planned date for each specialty clinic to transition over completely to Compass Rose™ but only the understanding that it would be a continuous process.

3.3. Post-implementation evaluation

The SMEs and Epic® team continued to meet post implementation to address any feedback provided by the staff. Once the feedback was resolved, staff were notified by email and changes were discussed in group meetings. This period was also used to standardize roles, tasks, and workflows between each specialty clinic. Additionally, IT Education on Compass Rose™ procedures and utilization was developed to provide standard training for all new staff.

4. Results

The study survey was distributed to all specialty pharmacy staff members ($n = 74$) with a response rate of 34.4%, resulting in 24 completed surveys prior to implementation. The same staff members also completed the study survey post-implementation (Table 1). Survey respondents were from seven out of the fifteen specialty clinics.

There was no significant difference in the primary outcome of staff satisfaction before or after Compass Rose™ implementation (3.96 ± 0.95 versus 3.70 ± 0.69, $p = 0.29$, Table 2). Additionally, there was no significant difference observed in the predicted versus actual challenge of module implementation (3.67 ± 1.17 versus 3.09 ± 0.96, $p = 0.064$, Table 2), or patient satisfaction scores (4.91 ± 0.32 versus 4.82 ± 0.50, $p = 0.10$, Table 2). There was a statistically significant decrease in refill documentation time in the infectious disease clinic (6.29 ± 3.91 minutes versus 3.55 ± 2.07 minutes, $p = 0.03$, Table 2) and a statistically significant increase in refill documentation time in the solid organ transplant clinic (1.44 ± 0.47 minutes versus 3.87 ± 0.23 minutes, $p < 0.001$, Table 2). No statistically significant difference was observed in refill documentation time in the gastroenterology, pulmonary, and oncology clinics. Overall, there was no significant difference in refill documentation time pre- versus post- Compass Rose™ implementation (4.22 ± 3.15 minutes versus 4.10 ± 2.36 minutes, $p = 0.82$, Table 2) between all five clinics. There was a statistically significant increase in turnaround time post Compass Rose™ implementation (2.59 ± 2.85 versus 2.69 ± 2.35, $p = 0.002$, Table 2). The number of inbound calls per patient was 1.60 in the pre-implementation phase and 1.92 in the post-implementation phase.

Results of qualitative survey responses are in Fig. 2.

Table 1
Demographics of Survey Responders.

Role	Number of Participants
Pharmacist	14
Technician	8
Other	2

Table 2
Quantitative Results from Staff Survey and Refill Documentation Time Study.

	Pre-Implementation	Post-Implementation	*p*-value
Staff Satisfaction with Current Process (out of 5)	3.96 ± 0.95	3.70 ± 0.69	0.29
Challenge of Implementation (out of 5)	3.67 ± 1.17	3.09 ± 0.96	0.064
Turn Around Time (days)	2.59 ± 2.85	2.69 ± 2.35	**0.002**
Refill Documentation Time (minutes)			
Overall	4.22 ± 3.15	4.10 ± 2.36	0.82
Gastroenterology	3.49 ± 0.80	3.01 ± 1.92	0.48
Infectious Disease	6.29 ± 3.91	3.55 ± 2.07	**0.03**
Oncology	6.18 ± 3.41	4.64 ± 2.05	0.24
Pulmonology	7.00 ± 3.76	5.95 ± 3.43	0.52
Solid Organ Transplant	1.44 ± 0.47	3.87 ± 0.23	**<0.001**
Inbound Calls per Patient	1.60	1.92	*
Patient Satisfaction	4.91 ± 0.32	4.82 ± 0.50	0.10

* Unable to assess statistical significance

5. Discussion

To the best of our knowledge, this is the first study of its kind to evaluate the impact of a task driven patient care coordination application for specialty pharmacy services. Compass Rose™ implementation had no significant impact on staff satisfaction, patient satisfaction, or refill documentation time. Prescription turnaround time increased, which could be due to use of Compass Rose™, or due to significant workflow changes apart from Compass Rose™ implementation such as increased prescription volume and training new staff. Six months prior to Compass Rose™ implementation, the UC Davis Specialty Pharmacy processed and dispensed 11,678 specialty prescriptions. In the six months post-Compass Rose™ implementation, there were 12,752 specialty prescriptions processed and dispensed.

Regarding refill documentation time, there were no significant trends in documentation time overall. Each clinic had their own workflow for calling and documentation which is why a pre-post analysis on each clinic respectively would yield more accurate results than comparing the clinics to one another. For example, the solid organ transplant clinic had not been documenting their calls in EMR prior to Compass Rose™ implementation (they were documented in a separate Excel®) which increased their refill documentation time post-implementation, while the infectious disease clinic was able to add smart phrases at the time of Compass Rose™ implementation which reduced the amount of manual documentation that was performed and decreased refill documentation time post-implementation. Data

	Pre- Implementation Excel®	Post-Implementation Compass Rose™
How satisfied are you with the current patient management tool?	"Duplication of work"	"Too many clicks to do a task"
	"Accessible"	"Easy to manage and set reminder tasks"
	"Customization specific to area"	"Still need to standardize"
What issues/challenges are you experiencing with the current patient management tool?	"Inefficient having to double document"	"Extra clicks to get the job done"
	"Risk with losing information"	"We need the patient management spreadsheet to sort with date due AND name"
	"Very prone to error"	"Working through the standardization process"
How challenging do you anticipate/ was Compass Rose™ implementation?	"New system/workflow"	"Manual process moving patients over quite challenging"
	"Time to receive training"	"Biggest barrier is inadequate training prior to implementation"
	"Anticipate that Compass Rose's inability to allow for quick input can slow down workflow"	"Effort to standardize the patient management spreadsheets"

Fig. 2. Qualitative Survey Results – Excerpts of Staff Responses.

collection was avoided in the immediate post-implementation phase due to an expected decrease in performance as pharmacy staff learn the new system.

Pharmacy technology integration and workflow modifications are vital to ensure medication coordination is safe and timely.[5] Epic's Compass Rose™ module has previously been used in high-risk social work for assessing social determinants of health, tracking patient outcomes, and enrolling patients in community-based programs.[6] Utilization of case management software can be applied to a multitude of health care areas worldwide, including many areas of pharmacy practice. Specialty pharmacy services are highly task driven, including clinical assessments, refills, prior authorizations, lab monitoring, and side effect management. Optimal care coordination and follow-up are vital to patient outcomes, and pharmacists and technicians are in a unique position to help patients navigate a complex health system.[7,8] Compass Rose™ may serve as a useful tool to allow specialty pharmacy teams to accurately perform and track these care coordination needs and further offers the ability to track interventions and outcomes.

Strengths of our study include the novelty of the study question and the ability to track metrics and staff satisfaction pre- and post- Compass Rose™ implementation. Limitations of our study include our inability to measure the timeliness of URAC patient assessments before and after Compass Rose™ implementation. The data prior to implementation were collected by random auditing and therefore we would not have been able to make an accurate comparison. The impact of cognitive load on each user when learning a new system is unknown and likely varies between individuals which may have impacted prescription TAT and refill documentation time. Additionally, surveys were not anonymous and were not completed by all specialty pharmacy staff. This was to allow for the same participants in both the pre- and post-implementation surveys because of voluntary response sampling. Refill documentation time was done under direct time study which could have impacted the time taken to perform and document each refill call. Finally, the discussion is limited by lack of ability to compare to existing data given the novelty of this report.

5.1. Lessons learned

During the pre-implementation phase, each specialty pharmacy clinical area developed its own method for implementation and initial utilization of Compass Rose™. Later, the specialty pharmacy workflows were standardized, leading to the submission of additional Compass Rose™ IT change requests and modifications to staff workflow. It may be helpful to start the process with documented, standardized specialty pharmacy workflows for both pharmacists and pharmacy technicians so that the IT team can tailor the Compass Rose™ module to the specialty pharmacy workflows. During pre-implementation, validation of the Compass Rose™ module in Epic®'s environment is key to ensuring that the Compass Rose™ module is functioning as anticipated for all end users, to identify changes that may be needed prior to implementation, and to identify potential pain points for staff that should be addressed in training. There could have been a more robust training program for users prior to Compass Rose™ implementation with hands-on utilization of the program in their specific clinical area using Epic®'s testing environment, rather than a general overview and introduction of the program. This institution could have also benefited from more consultation with other institutions that have previously implemented Compass Rose™ to gain knowledge about their process.

One additional improvement to our implementation process would be using a phased or pilot approach rather than a specific implementation date for all clinical areas. This method could have avoided the two-week delay in data imports from the legacy system which would have mitigated duplicative work, and likely led to users more quickly utilizing Compass Rose™.

After the implementation of Compass Rose™, many enhancement tools that can be used within the EMR have been created to better capture the numerous services provided by our specialty pharmacy. Customizing tasks and creating unique descriptors for patient services allowed for detailed explanations of the work being performed daily. Additionally, we are developing a standardized pharmacist intervention form to be completed with patient encounters. Finally, we are recording a patient's progress towards achieving clinical goals through patient reported and therapeutic specific outcomes for various disease states. The metrics created through Compass Rose™ can demonstrate the high-quality patient care provided by a HSSP.

Although other specialty pharmacies will have their own process for Compass Rose™ implementation, the authors hope other health-systems can utilize this information and lessons learned to streamline implementation and minimize impact to staff during program launch. These lessons are highlighted in Fig. 3.

Pre- Implementation	Start with standardized workflows for both pharmacists and pharmacy technicians
	A more robust training program prior to implementation with hands-on utilization in their specific areas using a testing environment
	Consultation with other institutions that have previously implemented Compass Rose™
Implementation	A phased or pilot approach rather than a specific implementation date for all clinical areas to avoid delay and duplicative work.
Post Implementation	Customize tasks for unique patient services
	Utilize Compass Rose™ to track interventions and outcomes for various disease states

Fig. 3. Lessons Learned.

6. Conclusion

Compass Rose™ implementation had no significant impact on staff satisfaction, patient satisfaction, or refill documentation time. Prescription turnaround time increased, which could be due to Compass Rose™ or several other contributing factors such as increased prescription volume. Benefits of Compass Rose™ include standardization of workflow, task tracking, and ability to quantify staff performance and clinical impact. Clear standardization, vigorous testing and training, and a phased-implementation approach may improve the Compass Rose™ implementation process for other HSSPs.

CRediT authorship contribution statement

Selina Somani: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Shannan Takhar:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Data curation. **Derek Miller:** Writing – review & editing, Resources, Methodology, Formal analysis, Data curation, Conceptualization. **Hana Camarillo:** Writing – review & editing, Writing – original draft, Visualization, Resources, Project administration. **Mency Zhu:** Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Data curation. **Kathie Tran:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

1.. Wellmark. Specialty Drugs 101. Published January https://das.iowa.gov/media/2021/download?inline; 2023.
2. Rim MH, Thomas KC, Barrus SA, et al. Analyzing the costs of developing and operating an integrated health-system specialty pharmacy: the case of a centralized insurance navigation process for specialty clinic patients. *Am J Health Syst Pharm*. 2021;78(11):982–988. https://doi.org/10.1093/ajhp/zxab083.
3. Zuckerman AD, Whelchel K, Kozlicki M, et al. Health-system specialty pharmacy role and outcomes: a review of current literature. *Am J Health Syst Pharm*. 2022;79(21):1906–1918. https://doi.org/10.1093/ajhp/zxac212.
4.. Utilization Review Accreditation Commission (URAC). Specialty Pharmacy Services Accreditation. https://www.urac.org/accreditation-cert/specialty-pharmacy-services-accreditation/; 2023.
5. Gabriel MH, Kotschevar CM, Tarver D, Mastrangelo V, Pezzullo L, Campbell PJ. Specialty pharmacy turnaround time impediments, facilitators, and good practices. *J Manag Care Spec Pharm*. 2022;28(11):1244–1251. https://doi.org/10.18553/jmcp.2022.28.11.1244.
6.. Surety Systems. Epic Compass Rose and Epic Healthy Planet Integration 101. https://www.suretysystems.com/insights/epic-compass-rose-epic-healthy-planet-integration-101.
7. Cesarz J, Canfield S. Aligning health systems for continued success in specialty pharmacy. *Am J Health Syst Pharm*. 2021;78(11):919. https://doi.org/10.1093/ajhp/zxab113.
8. Penick T, Hawkins T, O'Reilly E, Maniyar H, Maier C, McPheeters C. Impact of embedding a pharmacist in a dermatology clinic on outcomes in a specialty pharmacy. *J Am Pharm Assoc*. 2003;63(2):661–666. https://doi.org/10.1016/j.japh.2022.09.009.