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Optimizing Polycythemia Vera Management Through a Collaborative Care Model Between Leukemia Oncologists and an Integrated Specialty Pharmacy

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Abstract

Polycythemia vera (PV) is a chronic myeloproliferative neoplasm that requires long-term hematologic control and symptom monitoring. Despite advanced therapies and treatment guidelines, real-world adherence to therapeutic goals and routine symptom assessment remains inconsistent, particularly outside the academic setting. To optimize care, a pharmacist-led clinical support program was implemented at Levine Cancer Institute, a large regional hematologic malignancy center, in collaboration with the integrated institutional Atrium Health Specialty Pharmacy Service (SPS). This program aimed to standardize PV care system-wide by improving hematocrit (Hct) control and supporting symptom burden assessment via Myeloproliferative Neoplasm Symptom Assessment Form (MPN-10) scores. Through diagnosis code screening and identification of patients with Hct ≥ 45%, the SPS pharmacist team provided clinical reviews, pharmacotherapy recommendations, financial access support, and coordinated care, including dispensing medication and providing medication education. Interim analysis demonstrated improved identification of opportunities for optimization, with sustained provider engagement. This model highlights the opportunity for advanced practitioners, including pharmacists, to improve disease control and quality of life for patients with PV.

Polycythemia vera (PV) is a Philadelphia-negative, clonal myeloproliferative neoplasm (MPN) driven by *JAK2* mutations, most commonly *JAK2* V617F or less frequently *JAK2* exon 12 mutations. These mutations are characterized by erythrocytosis, leukocytosis, and thrombocytosis that contribute to increased blood viscosity and thrombotic risk. Common symptoms of PV include fatigue, pruritus, arthralgia, splenomegaly, and hepatomegaly. With optimal care, many patients with PV can live a normal lifespan. Although PV may evolve into secondary myelofibrosis or acute leukemia, current treatments have not been shown to prevent disease progression. Rather, management strategies primarily aim to minimize thrombotic and hemorrhagic complications (Iurlo et al., 2020; Tefferi et al., 2021). Therapy goals of PV are to reduce thrombotic risk by achieving a hematocrit (Hct; measurement of the proportion of red blood cells) target of < 45%, managing symptoms, and mitigating disease progression (Marchioli et al., 2011; Gerds et al., 2022).

Patients with PV are stratified as low risk (age < 60 years and no history of thrombosis) or high risk (age ≥ 60 years or prior thrombosis). Risk category then guides therapeutic intensity and the use of cytoreductive therapy. Treatment for PV consists of therapeutic phlebotomy and low-dose aspirin for low-risk patients. For high-risk or uncontrolled patients, cytoreductive therapy such as hydroxyurea, interferons, or Janus kinase (JAK) inhibitors is indicated (Marchetti et al., 2022; Nurgat & Lawrence, 2022). Despite effective interventions, variability exists in real-world management, often due to provider familiarity, inconsistent symptom assessment, and barriers to medication access (Ferrari et al., 2019; Yacoub et al., 2019).

The Myeloproliferative Neoplasm Symptom Assessment Form (MPN-10) is a validated tool to assess symptom burden in MPNs. It is recommended for use as frequently as quarterly or at minimum during each clinic visit (Gerds et al., 2022). However, it remains underutilized, particularly in ambulatory hematology practices, including pharmacy settings.

Pharmacists are uniquely positioned to bridge care gaps in PV management. As demonstrated in the PERMANACE study, a pharmacist-led hydroxyurea management program significantly improved Hct control in PV patients (Andrick et al., 2020). In addition, pharmacists may be well positioned to optimize treatment selection, support adherence, assist with medication access, and conduct MPN-10 assessments. In North Carolina, clinical pharmacists may also practice under collaborative practice agreements (CPAs), allowing them to perform medication management, order labs, assess response, and adjust therapy under physician oversight. At our institution, oncology clinical pharmacists and specialty pharmacists collaborate closely with hematologists and the broader cancer care team, enabling a broader scope of interventions compared with more restrictive states. Given this practice setting and precedent, our institution implemented a pharmacist-driven program for myelofibrosis (MF) and sought to expand a similar model to the PV patient population (Chojecki et al., 2022).

OBJECTIVE

The objective of this initiative is to implement a pharmacist-led clinical support program to standardize and enhance the care of PV patients across a large health network. The program consists of a proactive screening process of PV patients who have not achieved goal Hct and evaluation of these patients' PV treatment history, assessment of their adherence to therapy, and integration of MPN-10 symptom assessments. This effort expands on the outcomes of the PERMANACE study and prior institutional success with MF care through pharmacist collaboration (Andrick et al., 2020; Chojecki et al., 2022).

Key opportunities that were identified for pharmacists' impact included:

- Monitor adherence and optimize cytoreductive therapy
- Support patient access to medications
- Manage thrombotic risk with appropriate antiplatelet/anticoagulant therapy
- Perform symptom assessments (MPN-10) between clinic visits.

These pharmacist interventions effectively reduced the burden on the physician team, standardized care across a large health-care system, and improved patient outcomes.

PROGRAM DESCRIPTION

This program was initiated at a multisite, major referral center for hematologic malignancies serving the metro region of Charlotte, North Carolina. Across the system, patients with PV are managed by various providers, resulting in variability in treatment practices and monitoring frequency. Given the progressive nature of PV and the evolving therapeutic landscape, there was a clear need for a standardized, multidisciplinary approach to optimize care.

To address these gaps, the leukemia care team partnered with the system-based Specialty Pharmacy Service (SPS) to develop and implement a pharmacist-driven PV clinical support program, modeled after a successful initiative for MF care. In October 2022, the program was formally launched with the objectives to review patients with PV not at the Hct goal of < 45% and offer recommendations for management optimization.

Prior to launch, a standardized protocol was developed, and SPS pharmacists received disease-specific education. Using a centralized workflow, pharmacists identified patients through electronic health record (EHR) reporting, focusing on those with active PV diagnosis codes and Hct levels ≥ 45%. Upon identification, SPS pharmacists performed comprehensive clinical reviews that included:

- Risk stratification (age, thrombotic history)
- Evaluation of current pharmacologic therapy for appropriateness and adherence
- Assessment of antithrombotic support, including need for antiplatelet or anticoagulation
- Review of symptom burden via MPN-10 score documentation (performed during clinic or during pharmacist specialty pharmacy calls)
- Analysis of adherence trends, based on dispense history, provider notes, and lab values (e.g., mean corpuscular volume [MCV] for patients on hydroxyurea).

For patients not at the Hct goal or presenting with suboptimal response, pharmacists proposed dose titrations, medication changes, or supportive care interventions. For example, in patients with subtherapeutic hydroxyurea exposure, recommendations included dose adjustments guided by Hct and MCV. For patients refractory or intolerant to hydroxyurea or needing to initiate or transition to newer agents such as ropeginterferon or ruxolitinib, SPS provided financial navigation, including benefit investigation, prior authorization assistance, and copay support, due to the high cost and insurance requirements associated with these therapies.

The program also included direct pharmacist engagement with patients. This involved education on disease state, medication use, and side effect management, as well as follow-up phone calls to assess adherence, address barriers, and conduct symptom assessments. In cases where the MPN-10 was not documented in the EHR, pharmacists either administered the tool themselves or recommended that providers obtain it at the next clinic visit.

Patients identified as nonadherent were placed on a pharmacist-led care plan, pending provider approval. These care plans included scheduled check-ins, prescription pick-up reminders, and troubleshooting of barriers to therapy continuation, whether clinical, logistical, or financial. Pharmacists documented all interventions in structured progress notes in the EHR and routed them to the primary hematology provider for co-signature and acknowledgment. Follow-up assessments were typically scheduled within 3 to 6 months, ensuring continuity of care and longitudinal monitoring.

This program allows pharmacists to play a proactive, centralized role in PV management by screening patient profiles for:

- Adherence and compliance trends
- MPN-10 symptom scores
- Appropriateness of antithrombotic therapy
- Opportunities for cytoreductive therapy optimization
- Need for financial or supportive care interventions.

In doing so, pharmacists serve as both clinical extenders and care coordinators, helping align real-world management with evidence-based guidelines and improving the timeliness of interventions across a large health-care network.

PROGRAM OUTCOMES

As of March 2023, a total of 503 patients with a diagnosis of PV were identified across the Atrium

Table 1. Baseline Characteristics for Clinical Review Patients

Baseline demographics	Clinical review patients (*n* = 54)
Median age (IQR)	69 (17)
Sex, male, *n* (%)	33 (61.1)
History of VTE, *n* (%)	10 (18.5)
High-risk PV, *n* (%)	43 (79.6)
Median Hct at enrollment, median (range)	47 (45–55)
Current PV treatment	
Phlebotomy	15 (27.8)
Hydroxyurea	15 (27.8)
Hydroxyurea/Phlebotomy	18 (33.3)
Ruxolitinib	2 (3.7)
Ruxolitinib/Phlebotomy	1 (1.8)
Ropeginterferon	1 (1.8)
No treatment	2 (3.7)

Note. Hct = hematocrit; IQR = interquartile range; PV = polycythemia vera; VTE = venous thromboembolism.

Table 2. Interim Analysis Endpoints for Clinical Review Patients

Interim analysis endpoints	Clinical review patients (*n* = 54)
Median no. of recommendations, median (range)	2 (0–4)
Median no. of services offered, median (range)	2 (0–4)
Provider response/ acknowledgement, *n* (%)	54 (100)

Health network. Using a report that screened for patients with Hct levels ≥ 45%—irrespective of their current therapy or dispensing location (internal or external specialty pharmacy)—108 patients were identified as having uncontrolled Hct. Of these, 61 patients were enrolled into the specialty pharmacist-driven PV clinical support program, and 54 patients had completed pharmacist-led clinical reviews by the time of this analysis.

Baseline characteristics of the 54 patients reviewed are summarized in Table 1. Across these reviews, SPS pharmacists provided a median of two clinical recommendations and two patient services per encounter (Table 2). Examples of pharmacist recommendations included:

- Cytoreductive therapy dose optimization (most commonly hydroxyurea titration)
- Initiation or adjustment of antiplatelet therapy (e.g., low-dose aspirin)
- Recommendations for reassessing symptom burden using the MPN-10 tool.

Services offered by SPS pharmacists included benefit investigations for high-cost agents (e.g., ropeginterferon, ruxolitinib), development of patient care plans to improve medication adherence, and administration or coordination of MPN-10 symptom assessments.

Notably, providers acknowledged 100% of pharmacist documentation via co-signature in the electronic health record. Fifteen percent of pharmacist recommendations were accepted and implemented. While this initial acceptance rate is modest, it reflects the reality that PV patients are typically seen in clinic only every 6 to 12 months. Many pharmacist reviews were completed in advance of the next scheduled provider visit, limiting the ability for timely clinical action. As the program matures and coordination improves, we anticipate an increase in recommendation uptake and a clearer impact on patient outcomes.

Program evaluation continues and includes tracking longitudinal Hct values of enrolled patients to assess trends in disease control over time. This data will serve as a key clinical endpoint to measure the effectiveness of pharmacist-driven interventions. Continued collaboration

with hematology providers is critical to integrating pharmacist assessments more firmly into the patient care model and optimizing the overall impact of the program.

CONCLUSION

A pharmacist-led PV clinical support program was successfully implemented across a large health-care network. This model identified patients with suboptimal disease control and allowed pharmacists to contribute meaningfully to therapy optimization, symptom management, and access support. Pharmacist integration into PV care, particularly through proactive identification and comprehensive review, represents a scalable approach to standardize and improve care for patients with PV.

This model also underscores important opportunities for all advanced practitioners (APs) who manage the majority of routine PV care in many hematology practices. Understanding key disease markers, including Hct trends, thrombotic risk features, treatment adherence indicators, and MPN-10 symptom scores, enables APs to partner effectively with pharmacists and other members of the care team in proactive disease monitoring. Integrating pharmacist-led reviews with AP-driven clinical assessment enhances continuity, promotes guideline-concordant care, and ensures earlier escalation of therapy when patients demonstrate suboptimal disease control.

FUTURE DIRECTIONS

Based on promising results, the cancer center and SPS intend to scale the program to additional hematology clinics and explore its application to other MPNs, including essential thrombocythemia and early MF. Ongoing goals include full EMR integration of MPN-10 as a standardized assessment tool and increasing specialty pharmacist staffing to support proactive follow-up care.

This initiative highlights the importance of embedding clinical pharmacists into chronic hematologic care pathways and supports a framework for value-based, patient-centered management of MPNs. ●

Disclosure

The authors have no conflicts of interest to disclose.

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