Gary L, a 62-year-old man, was diagnosed with PV 1 year ago when he presented with a deep venous thrombosis (DVT). He has been followed at our clinic since then, and we have had the opportunity to observe his disease progression over the last year. At his last appointment, he was noted to have splenomegaly, aquagenic pruritus, and headache. His white blood cell (WBC) count was elevated to the upper limit of normal.

He was prescribed hydroxyurea (HU), but his symptoms continued to worsen. He also reported side effects, such as increased sweating, fatigue, and headaches. HU was increased to 1000 mg twice daily, and aspirin 81 mg once daily. At his 6-month follow-up appointment, his splenomegaly was slightly decreased and his headaches were better, but because of increased WBC, hydroxyurea was increased to 1000 mg twice daily.

VIRTUAL PATIENT SIMULATION: IMPROVING MANAGEMENT OF POLYCYTHEMIA VERA

PATIENTS NO LONGER RESPONDING TO CYTOREDUCTIVE THERAPY

The assessment sample consisted of decisions made by 136 US practicing hematologist-oncologists who participated in the VPS-based educational initiative and proceeded to the concluding Case Review section within the study period. A result of CG provided through simulation, significant improvements were observed in several areas of management of PV patients no longer responding to HU, including:

- Continuing HU therapy (9% pre-CG vs 46% pre-CG; P <.001) (see Figure 5A).
- Discontinuation of HU therapy (25% post-CG vs 25% pre-CG; P >.05) (see Figure 3).
- Administration of second-line therapy for PV (10% post-CG vs 20% pre-CG; P <.05) (see Figure 4).

The most commonly cited reasons for selection of ruxolitinib as their next PV treatment were "impact on hematologic response" and "impact on quality of life." (Figure 6).

CONCLUSION

Hematologist/oncologists who participated in the educational intervention demonstrated significant improvements in clinical decisions related to the management of PV no longer responding to HU. However, because 7% of learners did not follow an evidence-based approach to managing this patient before CG, and 44% are still responding to HU, there is a strong need for further education. A VPS platform that immerses and engages the clinician in an authentic, practical, and consequence-free learning experience has the potential to improve patient outcomes and quality of life.

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## BACKGROUND

Clinical symptoms of polycythemia vera (PV) include various occlusive events, sporadic, episodic pruritus, and hemorrhagic complications after injury. Headache, fatigue, excessive sweating, gingival and gastrointestinal bleeding, and abdominal pain can also occur. About 20% to 30% of patients go on to develop post-PV myelofibrosis (MF), and 5% to 10% experience leukemic transformation.

The median survival time after a diagnosis of PV can exceed 10 to 20 years, although this is significantly shortened to 7 years in the event of post-PV myelofibrosis (MF). Approximately 24% of patients with PV treated with hydroxyurea (HU) will eventually experience resistance and intolerance to HU, resulting in an increased risk of death and transformation to MF or acute myeloid leukemia (AML). Despite this, many PV patients who experience loss of response to frontline cytoreductive therapy receive suboptimal disease management.

Therefore, a study was conducted to determine if virtual patient simulation (VPS), an online, interactive simulation-based learning tool, could improve clinical competence and performance of hematologists/oncologists in the management of a PV patient no longer responding to HU.

## METHODS

Education was delivered online via a simulator. Interactive, VPS-based learning platform that modeled real-life clinical encounters. Physicians/learners were presented with two patient cases of PV, one of which was analyzed for this study (Figure 1).

- Following a virtual interaction to learn more about each patient, physicians were challenged to order lab tests and determine treatment protocols. Possible order options were not limited by multiple choice but rather were supported by a database matching the scope and depth of choices available in actual practice. Clinical decisions made by learners were analyzed using a sophisticated decision engine within the simulation VPS platform, and tailored clinical guidance (CG) based on current evidence and expert recommendations was provided in response to each learner decision.

Data were collected from a cohort of US practicing hematologist-oncologists who made clinical decisions from activity launch on April 25, 2016, through June 9, 2016

- Effect of CG on learner decision.

Ordering an MNPI Symptom Assessment Form (17% post-CG vs 48% pre-CG; P <.001) (see Figure 8).

The most commonly cited reasons for selection of ruxolitinib as the next PV therapy were "impact on hematologic response" and "impact on quality of life." (Figure 6).

## RESULTS

The assessment sample consisted of decisions made by 136 US practicing hematologist-oncologists who participated in the VPS-based educational initiative and proceeded to the concluding Case Review section within the study period. A result of CG provided through simulation, significant improvements were observed in several areas of management of PV patients no longer responding to HU, including:

- Continuing HU therapy (9% pre-CG vs 46% pre-CG; P <.001) (see Figure 5A).
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### REFERENCES