



# Effect of Rusfertide on Cyto-reductive Therapy Use in Patients with Phlebotomy Dependent Polycythemia Vera: Post Hoc Analysis from the Randomized Controlled Phase 3 VERIFY Study

**Francesca Palandri, MD, PhD<sup>1</sup>**; Gregory S. Vosganian, MD<sup>2</sup>; Andrew T. Kuykendall, MD<sup>3</sup>; Aniket Bankar, MD, MSc, MBBS, DM<sup>4</sup>; Naveen Pemmaraju, MD<sup>5</sup>; Valentín García-Gutiérrez, MD<sup>6</sup>; Alessandro Lucchesi, MD, PhD<sup>7</sup>; Jiri Mayer, MD<sup>8</sup>; Harinder Gill, MBBS, MD, FRCP, FRCPath<sup>9</sup>; Antonin Hlusi, MD, PhD<sup>10</sup>; Daniel Sasca, MD<sup>11</sup>; Joseph M. Scandura, MD, PhD<sup>12</sup>; David M. Ross, MBBS, PhD<sup>13</sup>; Maria Laura Fox, MD, PhD<sup>14</sup>; Alessandro Maria Vannucchi, MD<sup>15</sup>; Steffen Koschmieder, MD<sup>16</sup>; Jean-Jacques Kiladjian, MD, PhD<sup>17</sup>; Phillip Dinh, PhD<sup>18</sup>; Jie Xiao, MS<sup>19</sup>; Vidhyavathi Venkataraman, MS<sup>20</sup>; Elizabeth Lindemülder, MS<sup>21</sup>; Arturo Molina, MD, MS<sup>22</sup>; Joseph Shatzel, MD, MCR<sup>23</sup>

<sup>1</sup>IRCCS Azienda Ospedaliero-Universitaria di Bologna - Institute of Hematology "L. and A. Seragnoli", Bologna, Italy; <sup>2</sup>Protagonist Therapeutics, Inc., Newark, CA, United States of America; <sup>3</sup>Moffitt Cancer Center, Tampa, FL, United States of America; <sup>4</sup>Princess Margaret Malignancy Centre, Toronto, ON, Canada; <sup>5</sup>MD Anderson Cancer Center, Houston, TX, United States of America; <sup>6</sup>Hospital Universitario Ramón y Cajal Instituto Ramón y Cajal de Investigación Biomédica, Universidad de Alcalá, Madrid, Spain; <sup>7</sup>IRCCS Istituto Romagnolo per lo Studio dei Tumori (IRST) "Dino Amadori", Meldola, Italy; <sup>8</sup>University Hospital and Masaryk Memorial Institute, Brno, Czech Republic; <sup>9</sup>Department of Medicine, School of Clinical Medicine, LKS Faculty of Medicine, the University of Hong Kong, Hong Kong; <sup>10</sup>Palacky University and University Hospital Olomouc, Olomouc, Czech Republic; <sup>11</sup>Universitätsmedizin der Johannes Gutenberg - Universität Mainz, Mainz, Germany; <sup>12</sup>Silver MFN Center/Wall Center/Well Center/Well Center, New York, NY, United States of America; <sup>13</sup>Royal Adelaide Hospital, Adelaide, Australia; <sup>14</sup>Vali of Hebron Institute of Oncology (VHIO), Hospital Universitario Vall d'Hebron, Barcelona, Spain; <sup>15</sup>Azienda Ospedaliero-Universitaria Careggi, Firenze, Italy; <sup>16</sup>RWTH Aachen University, Faculty of Medicine, and Center for Integrated Oncology (CIO-ABCD), Aachen, Germany; <sup>17</sup>Hôpital Saint-Louis, Université Paris Diderot, Paris, France; <sup>18</sup>Oregon Health & Science University, Portland, OR, United States of America

## BACKGROUND

- Polycythemia vera (PV) is a myeloproliferative neoplasm that is characterized by the excessive production of erythrocytes and may include elevations in leukocytes and platelets<sup>1,2</sup>
  - Over-proliferation of blood cells leads to elevated risk of thromboembolic events (TEs) and cardiovascular (CV) events
- Therapeutic phlebotomy is recommended for all patients with PV to control hematocrit (Hct) <45%, reduce the risk of arterial and venous TEs, and reduce CV mortality<sup>3-6</sup>
  - Use of phlebotomy with cyto-reductive therapy (CRT) is recommended for patients with high-risk PV (defined as those ≥60 years old and/or those with a history of prior TEs) and uncontrolled Hct >45%
- Rusfertide is a first-in-class, subcutaneously injected peptide mimetic of hepcidin, the principal regulator of iron homeostasis<sup>7,8</sup>
- VERIFY (NCT05210790) is an ongoing phase 3 study that included patients with PV who were receiving frequent phlebotomy and had poorly controlled Hct<sup>9</sup>
  - During the randomized, placebo-controlled portion of the trial, rusfertide plus current standard-of-care (SOC) therapy met its prespecified primary endpoint of clinical response (absence of phlebotomy eligibility) and all four key secondary endpoints vs placebo with SOC<sup>10</sup>
  - The safety profile of rusfertide was consistent with prior phase 2 studies<sup>7,11</sup>

## OBJECTIVE

- To describe dose increases, dose decreases, and treatment discontinuation of CRT in a post hoc analysis of VERIFY

## METHODS

- In the phase 3 VERIFY study, patients were randomized (1:1) to receive rusfertide or placebo with concurrent SOC therapy (ie, phlebotomy with or without CRT)
- After completing the 32-week double blind period, all patients were potentially eligible to receive rusfertide during the open-label period
- In this post hoc analysis, data from patients exposed to rusfertide (n=285) were analyzed to identify patients who:
  - Discontinued CRT without restarting CRT; or
  - Reduced their dose of CRT (ie, reduced weekly CRT dose [any magnitude] used at randomization and lasting ≥12 weeks without returning to their baseline weekly CRT dose); or
  - Increased their weekly CRT dose that was used at baseline or started a new CRT
- Results were analyzed using descriptive statistics

## RESULTS

- Baseline characteristics are summarized in **Table 1**
- These analyses included 293 randomized patients (rusfertide, n=147; placebo, n=146) with a median (range) age of 57 (27-86) years
  - Patients were 73.0% male, 46.8% had high-risk PV (rusfertide arm, 66/147 [44.9%]; placebo arm, 71/146 [48.6%]), and 55.3% were receiving concurrent CRT at baseline (rusfertide arm, 82/147 [55.8%]; placebo arm, 80/146 [54.8%])
- As of 10 December 2025, the median (range) duration of exposure for the 285 rusfertide-treated patients was 88.1 (2-158) weeks
  - At the cutoff date, 85% (242/285) of patients remained ongoing in VERIFY and continued to receive rusfertide with or without CRT

**Table 1. Baseline Characteristics of VERIFY Patients**

Characteristic	Part 1a (Baseline to Week 32)			Rusfertide-Treated Patients (n=285) <sup>a</sup>
	Rusfertide Arm (n=147)	Placebo Arm (n=146)	Randomized Patients (n=293) <sup>a</sup>	
<b>Age, median (range), years</b>	58 (28-86)	57 (27-82)	57 (27-86)	57 (27-86)
<b>Sex, n (%)</b>				
Male	106 (72.1)	108 (74.0)	214 (73.0)	207 (72.6)
Female	41 (27.9)	38 (26.0)	79 (27.0)	78 (27.4)
<b>Risk category,<sup>b</sup> n (%)</b>				
High risk	66 (44.9)	71 (48.6)	137 (46.8)	129 (45.3)
Age only	49 (33.3)	43 (29.5)	92 (31.4)	88 (30.9)
TE only	5 (3.4)	15 (10.3)	20 (6.8)	19 (6.7)
Age and TE	12 (8.2)	13 (8.9)	25 (8.5)	22 (7.7)
Low risk	81 (55.1)	75 (51.4)	156 (53.2)	156 (54.7)
<b>Phlebotomy + concurrent PV therapy, n (%)</b>				
Hydroxyurea	57 (38.8)	57 (39.0)	114 (38.9)	109 (38.2)
Interferon <sup>c</sup>	19 (12.9)	20 (13.7)	39 (13.3)	38 (13.3)
Ruxolitinib	5 (3.4)	2 (1.4)	7 (2.4)	7 (2.5)
>1 therapy	1 (0.7)	1 (0.7)	2 (0.7)	2 (0.7)
<b>No concurrent PV therapy (phlebotomy alone), n (%)</b>	65 (44.2)	66 (45.2)	131 (44.7)	129 (45.3)

PV, polycythemia vera; TE, thromboembolic events.  
<sup>a</sup>Includes all patients treated with rusfertide in VERIFY (n=285). In VERIFY (N=293), 2 patients were randomized but not dosed; 6 patients (placebo group) discontinued treatment before receiving rusfertide. <sup>b</sup>High-risk is defined as age ≥60 years or a history of prior TEs. Low-risk is defined as age <60 years and no prior TEs. <sup>c</sup>Includes interferon, peginterferon alpha-2a, and ropeginterferon alpha-2b.

## Cyto-reductive therapy use

- More than half of rusfertide-treated patients (156/285; 54.7%) were receiving CRT with phlebotomy at baseline
- Throughout the course of the trial, of the 156 rusfertide-treated patients who received CRT, 46 (29.5%) reduced their baseline CRT dose without discontinuation, 19 (12.2%) discontinued CRT, and 19 (12.2%) increased their weekly baseline CRT dose or started a new CRT (**Table 2**)
- The percentage of patients who reduced and/or discontinued CRT was slightly higher in patients with high-risk PV vs those with low-risk PV (**Table 3**)
  - Conversely, among patients who received concurrent CRT, the percentage of patients who increased their dose of CRT or started new CRT was higher in patients with low-risk PV than in those with high-risk PV
- The baseline mean (SD) *JAK2* V617F variant allele frequency percentage was lower in patients who reduced and/or discontinued CRT (43.7% [28.7]) than in those who increased their CRT dose or started a new CRT (55.1% [29.6])

**Table 2. Changes in Concurrent Cyto-reductive Therapy in Patients Treated with Rusfertide**

Change in CRT, n (%)	Phlebotomy + CRT					PHL Only (n=129)	Total <sup>a</sup> (n=285)
	HU (n=109)	IFN <sup>a</sup> (n=38)	Ruxolitinib (n=7)	Other <sup>b</sup> (n=2)	Any CRT (n=156)		
<b>Reduced and/or discontinued CRT</b>	47 (43.1)	16 (42.1)	1 (14.3)	1 (50.0)	65 (41.7)	N/A	65 (22.8)
Reduced CRT dose without discontinuation	32 (29.4)	12 (31.6)	1 (14.3)	1 (50.0)	46 (29.5)	N/A	46 (16.1)
Discontinued CRT	15 (13.8)	4 (10.5)	0	0	19 (12.2)	N/A	19 (6.7)
Reduced CRT and discontinued CRT	10 (9.2)	3 (7.9)	0	0	13 (8.3)	N/A	13 (4.6)
<b>Increased dose or started new CRT</b>	14 (12.8)	4 (10.5)	1 (14.3)	0	19 (12.2)	20 (15.5)	39 (13.7)

CRT, cyto-reductive therapy; HU, hydroxyurea; IFN, interferon; N/A, not applicable; PHL, phlebotomy.  
<sup>a</sup>Interferons include interferon, peginterferon alpha-2a, and ropeginterferon alpha-2b. <sup>b</sup>Includes HU + IFN (n=1) and HU + ruxolitinib (n=1). <sup>c</sup>Includes all patients treated with rusfertide in VERIFY (n=285). In VERIFY (N=293), 2 patients were randomized but not dosed; 6 patients (placebo group) discontinued treatment before receiving rusfertide.

**Table 3. Changes in Concurrent Cyto-reductive Therapy in Patients Treated with Rusfertide by PV Risk Category**

Change in CRT, n (%)	Low-Risk PV Rusfertide-Treated (n=156)		High-Risk PV Rusfertide-Treated (n=129)	
	PHL + Any CRT (n=60)	PHL Only (n=96)	PHL + Any CRT (n=96)	PHL Only (n=33)
<b>Reduced and/or discontinued CRT</b>	22 (36.7)	N/A	43 (44.8)	N/A
Reduced CRT without discontinuation	15 (25.0)	N/A	31 (32.3)	N/A
Discontinued CRT	7 (11.7)	N/A	12 (12.5)	N/A
Reduced CRT and discontinued CRT	6 (10.0)	N/A	7 (7.3)	N/A
<b>Increased dose or started new CRT</b>	11 (18.3)	13 (13.5)	8 (8.3)	7 (21.2)

CRT, cyto-reductive therapy; PHL, phlebotomy; PV, polycythemia vera.  
<sup>a</sup>High-risk is defined as age ≥60 years or a history of prior TEs. Low-risk is defined as age <60 years and no prior TEs.

- In rusfertide-treated patients who had any CRT dose reduction, the median (range) time from first dose of rusfertide to first dose reduction of CRT was 20.1 (2.0-96.1) weeks
  - Among patients treated with concurrent hydroxyurea who reduced their CRT dose, the mean percentage change from baseline in weekly CRT dose at first CRT reduction was greater in the rusfertide arm (40.8% decrease) vs the placebo arm (22.2% decrease)
- Among patients treated with concurrent interferon (interferon, peginterferon alpha-2a, and ropeginterferon alpha-2b), the mean percentage change from baseline in weekly CRT dose at first CRT reduction was similar in both arms (33.3% decrease)
- In rusfertide-treated patients who received concurrent hydroxyurea or interferon at baseline and discontinued CRT, median time to CRT discontinuation was 28.1 and 36.1 weeks, respectively

## Timing of weekly CRT dose reductions: hydroxyurea and interferon

- In rusfertide-treated patients who decreased their dose of CRT, the median (range) weekly dose of CRT in patients who received CRT concurrently at baseline was 7.0 g (2.5, 14.0) for hydroxyurea and 135.0 µg (15.0, 250.0) for interferon
  - In these patients, the median (range) time to first CRT reduction for hydroxyurea and interferon was 22.1 (2.0, 96.1) and 20.0 (2.1, 72.3) weeks, respectively
    - The median (range) percent change from baseline in weekly CRT dose at time of first CRT reduction was -40.8% (-5.9, -66.7) for hydroxyurea and -33.3% (-14.3, -50.0) for interferon
  - For patients with ≥1 CRT dose reduction, the median (range) time to last CRT reduction for hydroxyurea and interferon was 58.9 (9.0, 130.9) and 76.1 (6.1, 120.3) weeks, respectively
    - In these patients, the weekly dose of CRT at last reduction had a median (range) percentage change from baseline of -50.0% (-8.3, -84.6) for hydroxyurea and -62.5% (-42.9, -87.5) for interferon

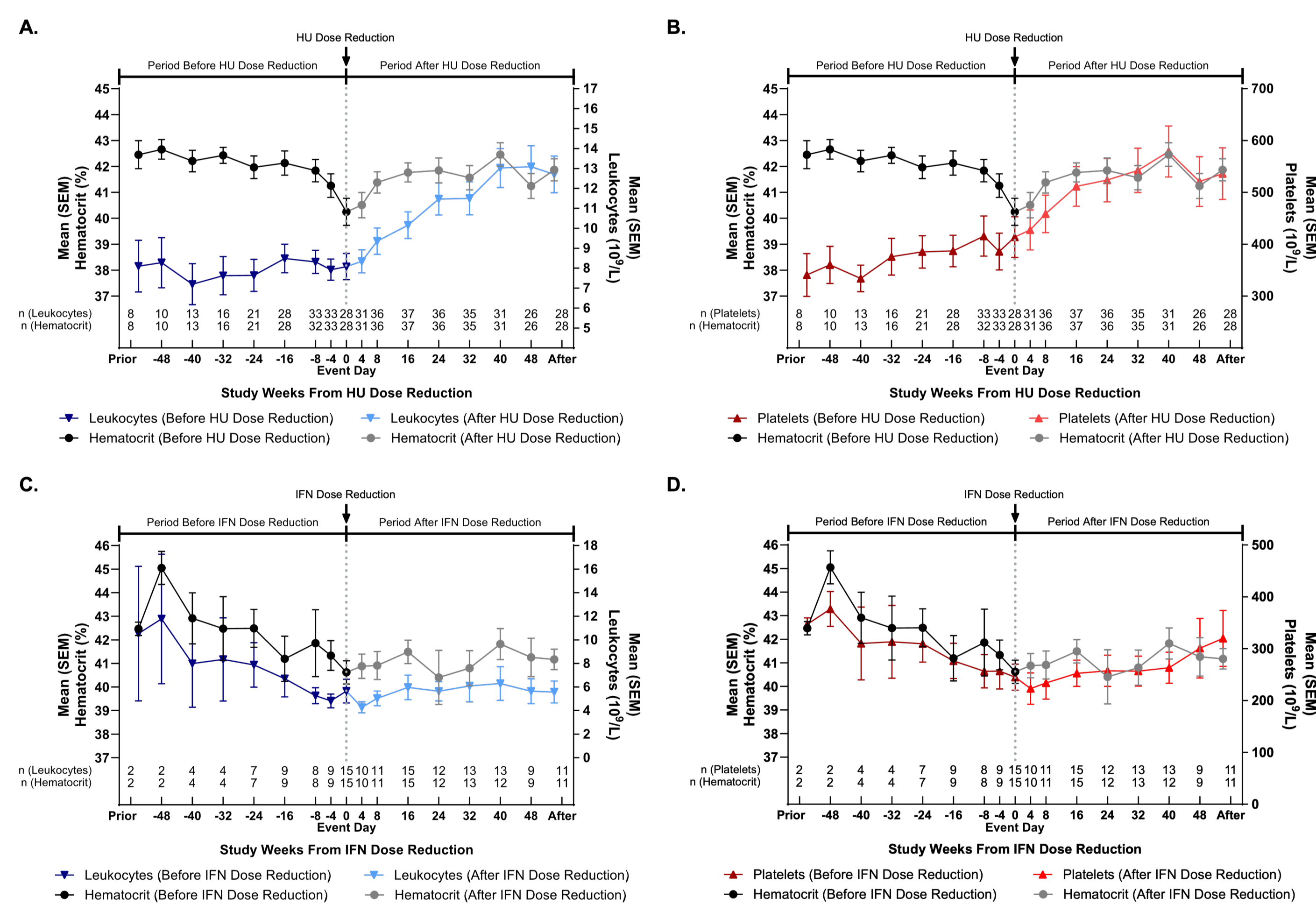
## Change in Hct levels

- In rusfertide-treated patients who received phlebotomy plus hydroxyurea or interferon, mean Hct levels remained <45% irrespective of whether patients had a CRT dose reduction (**Figure 1**)
  - The annualized phlebotomy rate remained unchanged in these patients

## Changes in leukocytes and platelets following CRT dose reduction or increase

- Leukocyte and platelet counts increased from baseline in rusfertide-treated patients who had a dose reduction in hydroxyurea (**Figure 1A, 1B**)
  - Larger proportional increases from baseline were observed in patients who discontinued hydroxyurea (data not shown)
- In rusfertide-treated patients who reduced their dose of interferon, leukocyte counts decreased slightly from baseline and stabilized throughout the course of the study; platelet counts remained below or similar to baseline levels (**Figure 1C, 1D**)
- In patients who were treated with concurrent hydroxyurea and had an increase in their CRT dose or started a new CRT, platelet counts remained similar to levels recorded prior to increases in CRT (data not shown)
  - In contrast, leukocyte counts decreased from baseline in patients treated with rusfertide and concurrent hydroxyurea who increased their CRT dose or started a new CRT
- Leukocyte and platelet counts declined slightly from baseline in patients who received concurrent interferon at baseline and who increased their CRT dose or started a new CRT (data not shown)

**Figure 1. Changes in Hct and (A, C) WBCs and (B, D) Platelets in Patients Treated with Rusfertide Receiving Concurrent Treatment with (A, B) Hydroxyurea or (C, D) Interferon**



CRT, cyto-reductive therapy; Hct, hematocrit; WBC, white blood cell.  
 Data on y-axes are mean (SEM). In Panels A-D, the "event" is dose reduction of CRT (HU, Panels A and B; IFN, Panels C and D). Numbers above the x-axes show the numbers of patients (n) at each timepoint (in weeks) before and after the event date at Week 0. Interferon includes interferon, peginterferon alpha-2a, and ropeginterferon alpha-2b.

## Safety

- In the 90 days prior to change in CRT dose, treatment-emergent adverse events (TEAEs) occurred in 47/59 (79.7%) patients who reduced their CRT dose, 13/19 (68.4%) patients who discontinued CRT, and 30/39 (76.9%) patients who increased their CRT dose (**Table 4**)
  - In the same period, serious adverse events (SAEs) were reported by 1 patient in each group (CRT dose reduction: 1.7%; CRT discontinuation: 5.3%; CRT dose increase: 2.6%)
- The percentage of patients experiencing TEAEs in the 90 days following CRT dose reduction or discontinuation decreased in all groups (reduced CRT dose, 31/59 [52.5%]; discontinued CRT, 7/19 [36.8%]; increased CRT dose, 21/39 [53.8%]) (**Table 4**)
  - There were no SAEs in any group following CRT dose reduction, discontinuation, or increase
- In all groups, the majority of TEAEs were generally mild-to-moderate in severity following changes in CRT dose (**Table 4**)
- There were no discontinuations of rusfertide among those patients who reduced or discontinued CRT at any point in the study
  - Among patients who increased their baseline CRT dose, there were 2 rusfertide discontinuations (5.1%), 1 each in the 90 days prior to and the 90 days following dose increase
- There were no deaths in any of the groups at any point during the study

**Table 4. Treatment-Emergent Adverse Events Before and After Change in CRT Dose**

Patients, n (%)	All VERIFY (Parts 1a, 1b, 2, and 3)	
	90 days before CRT dose reduction (n=59)	90 days after CRT dose reduction (n=59)
<b>Reduced CRT Dose</b>		
Any TEAE	47 (79.7)	31 (52.5)
Grade 3 or 4 TEAEs	2 (3.4)	1 (1.7)
Any SAE	1 (1.7)	0
<b>Discontinued CRT</b>		
Any TEAE	13 (68.4)	7 (36.8)
Grade 3 or 4 TEAEs	0	0
Any SAE	1 (5.3)	0
<b>Increased CRT Dose</b>		
Any TEAE	30 (76.9)	21 (53.8)
Grade 3 or 4 TEAEs	2 (5.1)	0
Any SAE	1 (2.6)	0

CRT, cyto-reductive therapy; SAE, serious adverse event; TEAE, treatment-emergent adverse event.

## CONCLUSIONS

- In this post hoc analysis of the phase 3 VERIFY study, 41.7% of patients with phlebotomy-dependent PV who were treated with CRT at baseline discontinued or reduced their dose of CRT
  - After initiation of treatment with rusfertide, 12.2% of patients started a new CRT or increased their weekly CRT dose
- In rusfertide-treated patients who decreased their dose of CRT, median time to first CRT reduction in hydroxyurea and interferon dose occurred after 6.5 and 8.3 months, respectively
- After the final dose reduction of CRT, hydroxyurea and interferon were being administered at a median percentage change from baseline of -50.0% and -62.5%, respectively
- In patients who received rusfertide and reduced or discontinued their CRT dose, mean Hct levels remained <45% without an increase in their annualized phlebotomy rate to maintain Hct levels <45%
- CRT dose modifications or initiation of new CRT therapy did not have a marked effect on all-grade adverse events or SAEs in rusfertide-treated patients
- Taken together, these post hoc results suggest that rusfertide treatment provides rapid, durable, and sustained control of Hct levels and reduces phlebotomy burden in patients with PV, including in patients who undergo CRT dose reductions or CRT discontinuation

## REFERENCES

- Patel AB, et al. *Leuk Lymphoma*. 2024;1-13.
- Harrison CN, et al. *Nat Rev Dis Primers*. 2025;11(1):26.
- McMullin MF, et al. *Br J Haematol*. 2019;184(2):176-91.
- Marchetti M, et al. *Lancet Haematol*. 2022;9(4):e301-e311.
- Teffari A, Barbati T. *Ann J Hematol*. 2023;98(9):1465-87.
- Kuykendall AT, et al. *Clin Lymphoma Myeloma Leuk*. 2024;24(8):512-22.
- Kremyskaya M, et al. *N Engl J Med*. 2024;390(8):723-35.
- Ginzburg YZ. *Vitam Horm*. 2019;110:17-45.
- Protagonist Therapeutics, Inc. 2022.
- Palandri F, et al. *N Engl J Med*. 2025;392(2):127-36.
- Kuykendall A, et al. *Blood*. 2025;148(Supplement 1):81.
- Cheung LP, et al. *Leuk Res*. 2025;159:108132.

## ACKNOWLEDGMENTS

VERIFY is sponsored by Protagonist Therapeutics, Inc. (Newark, CA, USA). The authors thank all patients and their caregivers who participated in the study along with all investigators, study staff, and clinical trial sites who contributed to VERIFY. Medical writing and editorial assistance were provided by John Watson, PhD and Anthony DiLauro, PhD, of the Propel Division of Woven Health Collective, LLC (New York, NY, USA), and Peter Morello of Protagonist Therapeutics, Inc. (Newark, CA, USA), and were funded by Protagonist Therapeutics, Inc.

## DISCLOSURES

FP reports an institutional grant from Protagonist Therapeutics; consulting fees from AOP Orphan, BMS, GSK, Novartis, Sanofi, Sobi, Takeda, and Incyte; and honoraria from AOP Orphan, BMS, GSK, Novartis, Sanofi, Sobi, Takeda, and Incyte.  
 GSV, PD, JX, VV, EL, AM report employment and stock or stock options with Protagonist Therapeutics, Inc.  
 ATK reports institutional grants from Protagonist Therapeutics, Novartis, Janssen, Geron, GlaxoSmithKline, BMS, Karlors, Blueprint, and DISC; consulting fees from Agios, Incyte, Protagonist Therapeutics, PharmaEssentia, Deciphera/Ono, Karyopharm, BMS, Takeda, Calyxt, Cogent, AbbVie, GSK, and Silence; payment or honoraria from Agios, Incyte, Protagonist Therapeutics, PharmaEssentia, Deciphera/Ono, Karyopharm, BMS, AbbVie, GSK, and Silence; and travel support from Takeda.  
 AB reports an institutional grant from Protagonist Therapeutics, and advisory board fees from Jazz Pharmaceuticals.  
 NP reports institutional grants from Protagonist Therapeutics, Novartis, Stemline, Samus, AbbVie, Cellectis, Affymetrix/ThermoFisher Scientific, Daiichi Sankyo, Plexikon, and Mustang Bio; consulting fees from Blueprint, Pacyflex, Immunogen, BMS, Clearview Healthcare Partners, Astellas, Protagonist Therapeutics, Triptych Health Partners, and CTI BioPharma; honoraria from Incyte, Novartis, LFB Biotechnologies, Stemline, Celgene, AbbVie, Mustang Bio, Roche Molecular Diagnostics, Blueprint, DAVA Pharmaceuticals, Springer Science + Business Media, Aptitude Health, Neo Pharm, and Care DX; travel support from Stemline, Celgene, AbbVie, DAVA Oncology, and Mustang Bio; advisory board participation with Blueprint, Pacyflex, Immunogen, BMS, Clearview Healthcare Partners, Astellas, Protagonist Therapeutics, Triptych Health Partners, and CTI BioPharma.

VG-G reports institutional grants from Protagonist Therapeutics, BMS, GSK, Incyte, Novartis, and Pfizer; travel support from ASD, BMS, GSK, Incyte, Novartis, and Pfizer; and advisory board fees from BMS, GSK, Incyte, Novartis, and Pfizer.  
 AL reports an institutional grant from Protagonist Therapeutics; consulting fees from MorphoSys, Amgen, Grifols, Novartis, Sanofi, and Protagonist Therapeutics; and honoraria from Sobi, Pfizer, Incyte, MorphoSys, Sanofi, Grifols, Amgen, Novartis, and BMS.  
 JM reports an institutional grant from Protagonist Therapeutics.  
 HG reports an institutional grant from Protagonist Therapeutics; honoraria from Astellas, BMS, GSK, MSD, Novartis, PharmaEssentia, and Otsuka; and travel support from MSD, Novartis, Pfizer, and PharmaEssentia.  
 AH reports an institutional grant from Protagonist Therapeutics, and honoraria from BMS, Novartis, Sobi, GSK, Amgen, Octapharma, and Novo Nordisk.  
 DS reports an institutional grant from Protagonist Therapeutics and honoraria from AbbVie, AstraZeneca, Blueprint, BMS, Gilead, and Novartis.  
 JMS reports institutional grants from Protagonist Therapeutics, AbbVie, SDP Oncology, Karyopharm, and Incyte; consulting fees from AbbVie, Novartis/Constellation, Incyte, SDP Oncology, Karyopharm, PharmaEssentia, Morphic, and Calico; and advisory board participation with AbbVie, Novartis/Constellation, Incyte, SDP Oncology, Karyopharm, PharmaEssentia, Morphic, and Calico.  
 DMR reports institutional grants from Protagonist Therapeutics and Novartis; consulting fees from Novartis, Merck, Takeda, Jubilant, and Prelude; and honoraria from Novartis, Merck, Takeda, and GSK.

MLF reports an institutional grant from Protagonist Therapeutics; consulting fees from GSK, Keros/Takeda, and Novartis; honoraria from GSK and Novartis; and travel support from Novartis.  
 AMV reports an institutional grant from Protagonist Therapeutics; consulting fees from Incyte, GSK, AOP Pharma, AbbVie, and Novartis; and honoraria from Italfarmaco, Blueprint Medicines, and Menarini Stemline.  
 SK reports institutional grants from Protagonist Therapeutics, Geron, Janssen, AOP Pharma, and Novartis; consulting fees from Pfizer, Incyte, Ariad, Novartis, AOP Pharma, BMS/Celgene, Geron, Janssen, CTI BioPharma, Roche, Bayer, GSK, Sierra Oncology, PharmaEssentia, Protagonist Therapeutics, Takeda, and MSD; honoraria from Novartis, BMS/Celgene, Pfizer, AstraZeneca, IOMEDICO, and Takeda; travel support from Alexion, Novartis, BMS, Incyte, AOP Pharma, CTI BioPharma, Pfizer, Celgene, Janssen, Geron, Roche, AbbVie, GSK, Sierra Oncology, Karlors, AstraZeneca, Protagonist Therapeutics, and IOMEDICO; advisory board fees from Pfizer, Incyte, Ariad, Novartis, AOP Pharma, BMS, Celgene, Geron, Janssen, CTI BioPharma, Roche, Bayer, GSK, Sierra Oncology, PharmaEssentia, Protagonist Therapeutics, Takeda, and MSD; and unpaid leadership roles with the German MPN Study Group, DGHO, and EHA.  
 JJK reports an institutional grant from Protagonist Therapeutics; consulting fees from AbbVie, BMS, and Novartis; honoraria from AOP Health, BMS/Celgene, and Novartis; and advisory board fees from Incyte.  
 JS reports an institutional grant from Protagonist Therapeutics and consulting fees from Aronora.