Suprachoroidal Delivery of Investigational ABBV-RGX-314 for Diabetic Retinopathy: The Phase II ALTITUDE® Study Dose Levels 1 and 2: One Year Results

November 6, 2023

Forward-looking Statements

This presentation includes "forward-looking statements," within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These statements express a belief, expectation or intention and are generally accompanied by words that convey projected future events or outcomes such as "believe," "may," "will," "estimate," "continue," "anticipate," "assume," "design," "intend," "expect," "could," "plan," "potential," "predict," "seek," "should," "would" or by variations of such words or by similar expressions. The forward-looking statements include statements relating to, among other things, REGENXBIO's future operations, clinical trials, costs and cash flow. REGENXBIO has based these forward-looking statements on its current expectations and assumptions and analyses made by REGENXBIO in light of its experience and its perception of historical trends, current conditions and expected future developments, as well as other factors REGENXBIO believes are appropriate under the circumstances. However, whether actual results and developments will conform with REGENXBIO's expectations and predictions is subject to a number of risks and uncertainties, including the outcome of REGENXBIO's collaboration with AbbVie and other factors, many of which are beyond the control of REGENXBIO. For a summary of certain of these risks and uncertainties, refer to the "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" sections of REGENXBIO's Annual Report on Form 10-K for the year ended December 31, 2022 and comparable "risk factors" sections of REGENXBIO's Quarterly Reports on Form 10-Q and other filings, which have been filed with the U.S. Securities and Exchange Commission (SEC) and are available on the SEC's website at www.sec.gov. All of the forward-looking statements made in this presentation are expressly qualified by the cautionary statements contained or referred to herein. The actual results or developments anticipated may not be realized or, even if substantially realized, they may not have the expected consequences to or effects on REGENXBIO or its businesses or operations. Such statements are not guarantees of future performance and actual results or developments may differ materially from those projected in the forward-looking statements. Readers are cautioned not to rely too heavily on the forward-looking statements contained in this presentation. These forward-looking statements speak only as of the date of this presentation. Except as required by law, REGENXBIO does not undertake any obligation, and specifically declines any obligation, to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

Agenda

Welcome

Phase II ALTITUDE® Trial of ABBV-RGX-314: Dose Levels 1 and 2 at 1 Year

- **Data Review**
- **Data Discussion with Retinal Specialists**
  - Mark Barakat, M.D., Director of Retinal Research Institute, Retinal Consultants of Arizona, Clinical Assistant Prof of Ophthalmology, University of Arizona College of Medicine
  - Peter Kaiser, M.D., Chaney Family Endowed Chair in Ophthalmology Research and Professor of Ophthalmology, Cleveland Clinic Lerner College of Medicine and Cole Eye Institute

Question & Answer

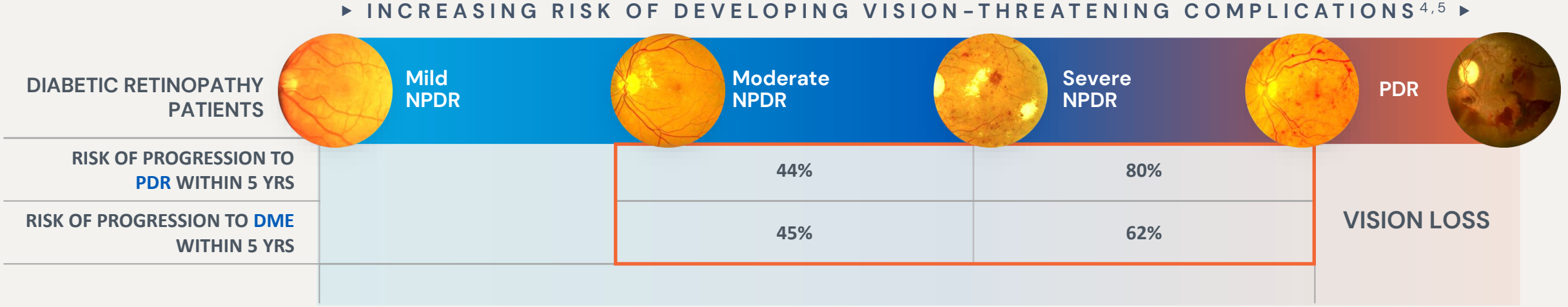
Diabetic retinopathy is a global public health problem

20M is the expected DR patient population in US, EU, JP in the next 5 years[1]

<1% of patients with early DR are treated due to high treatment burden[3]

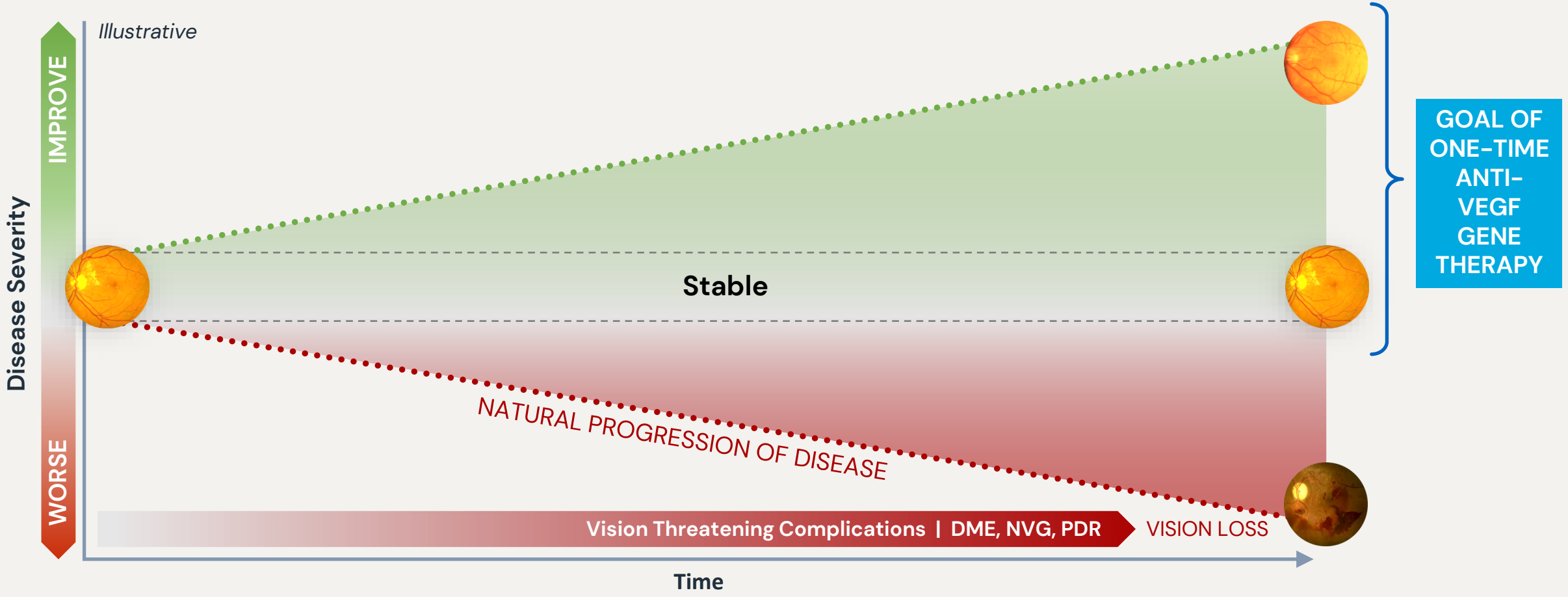
45–50 YRS Median age of disease onset

Early treatment with longer lasting therapy can potentially modify and prevent disease progression



1.DR Market, Reports and Data 2022; 2. Market Scope 2022 Retinal Pharmaceuticals; 3. Market Scope Q4-2022 Retina Quarterly Summary Report; 4. ETDRS Trial Report 12, 1991; 5. Moshfeghi, 2020
DR = diabetic retinopathy; NPDR = non-proliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy; DME = diabetic macular edema

One time, in-office injection of gene therapy could potentially provide long-lasting improvement in DR severity and reduce risk of vision-threatening complications



DME = Diabetic Macular Edema.
NVG = Neovascular Glaucoma.
PDR = Proliferative Diabetic Retinopathy.

Investigational in-office ABBV-RGX-314 for the treatment of diabetic retinopathy (DR)

ABBV-RGX-314 PRODUCT CANDIDATE

Vector:
AAV8

Gene:
anti-VEGF fab

Route of administration:
Suprachoroidal (wet AMD/DR)

Mechanism of action:
Reducing leaky blood vessel formation by giving ocular cells the ability to produce an anti-VEGF fab

Improved AAV vector technology

More efficient gene delivery to the RPE[a]

+

Leveraging current standard of care in transgene

FDA-approved mAbs and mAb fragments that inhibit VEGF are the current standard of care for the prevention of DR complications

ABBV-RGX-314 gene encodes an anti-VEGF mAb fragment (fab)

=

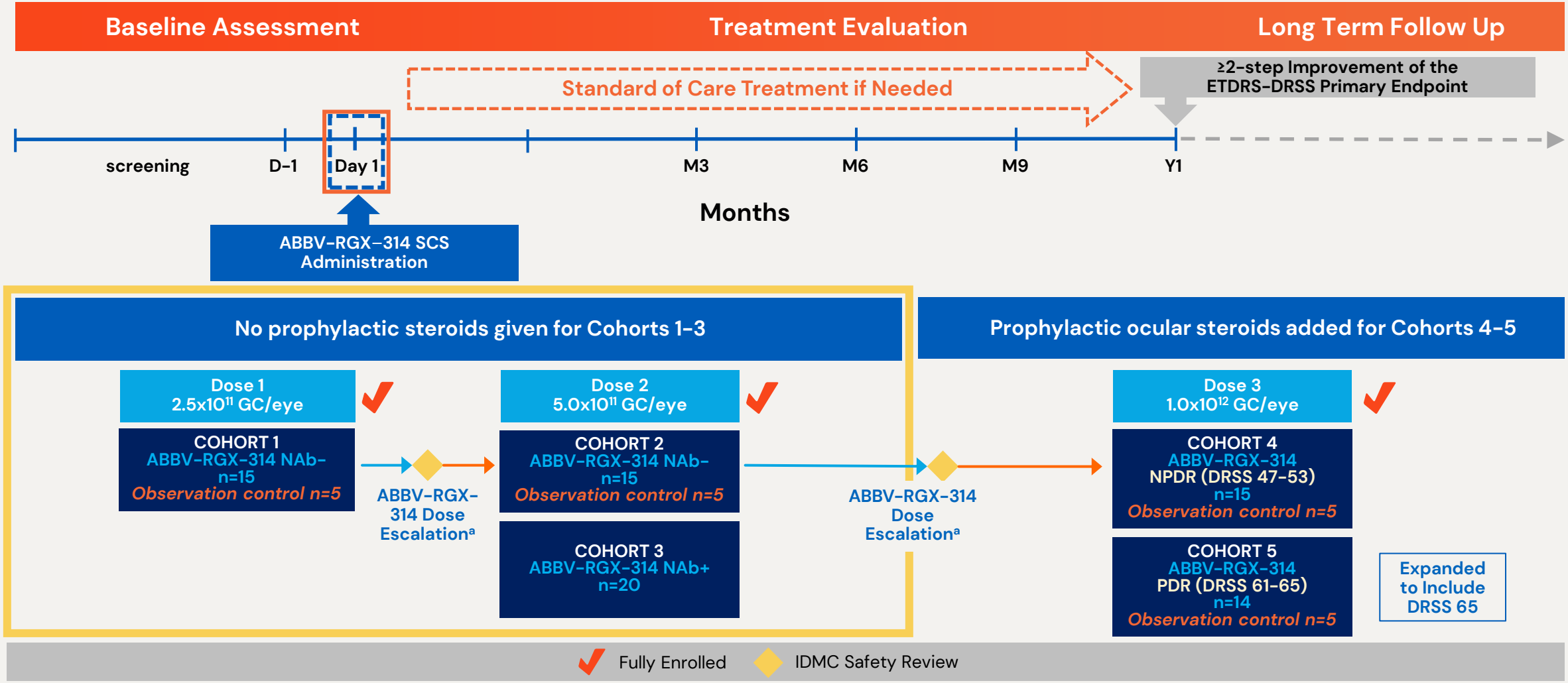
ABBV-RGX-314: AV8 encoding anti-VEGF fab

Potential for long-term therapeutic anti-VEGF expression

a. Vandenberghe et al. 2011 *Science Translational Medicine.*
AAV: Adeno-Associated Virus.

ABBV-RGX-314 ALTITUDE® Study Design

Moderately severe NPDR, severe NPDR, or mild PDR patients without active CI-DME



a. Dose escalation safety review to occur two weeks after final subject in each cohort has been dosed.
SCS: Suprachoroidal Space; NAb+ = AAV8 neutralizing antibody positive; NAb- = AAV8 neutralizing antibody negative/low; Y1 = 48 weeks; NPDR: Non-proliferative Diabetic Retinopathy; PDR: Proliferative Diabetic Retinopathy

ALTITUDE® baseline characteristics (dose levels 1 and 2)

	Variable	Observational Control (N=10)	Dose Level 1 Cohort 1 (N=15)	Dose Level 2 Cohort 2 (N=15)	Dose Level 2 Cohort 3 (N=20)	Total (N=60)
BASELINE[a]	**Mean Age** (Years)	52.5	50.7	58.1	60.1	56.0
	Gender – Female	1(10.0%)	9 (60.0%)	7 (46.7%)	8 (40.0%)	25 (41.7%)
	Hemoglobin A1c	7.7	8.2	8.5	8.2	8.2
	DR Category at Baseline					
	DRSS 47 (Moderately Severe NPDR)	8 (80.0%)	4 (26.7%)[b]	9 (60.0%)	12 (60.0%)	33 (55.0%)
	DRSS 53 (Severe NPDR)	0	2 (13.3%)	1 (6.7%)	2 (10.0%)	5 (8.3%)
	DRSS 61 (Mild PDR)	2 (20.0%)	8 (53.3%)[c]	5 (33.3%)	6 (30.0%)	21 (35.0%)
	DRSS 65 (Moderate PDR)	0	1 (6.7%)[d]	0	0	1 (1.7%)
	Screening BCVA (Snellen equivalents)	84.5	78.1	82.1	81.3	81.3
	Screening OCT CRT (µm)	271.6	259.5	272.4	274.4	270.4
	Lens Status – Phakic n (%)	9 (90.0%)	13 (86.7%)	10 (66.7%)	13 (65.0%)	45 (75.0%)
DISEASE HISTORY	**Study Eye with anti-VEGF Injections in the Past 36-months n** (%)	1(10.0%)	5 (33.3%)	0	0	6 (10.0%)
	Months Since DR Diagnosis[e] – Mean	23.7	27.8	26.0	22.5[f]	24.9

a. Ocular variables refer to study eye only.
b. One patient had a missing HbA1c measurement at baseline.
c. During an interim central reading center masked adjudication, 1 patient had baseline DRSS updated from Grade 47 to Grade 61 since prior interim data release.
d. After randomization, central reading center DRSS was scored as Grade 65 on masked adjudication.
e. Calculation based on randomization date.
f. One patient is missing date of DR diagnosis and not included.

REGENXBIO

ALTITUDE® interim safety summary: dose levels 1 and 2 through 1 year

ABBV-RGX-314 has been well-tolerated in Dose Levels 1 and 2 (n=50)

- 7 SAEs: none considered drug-related
- No cases of chorioretinitis, vasculitis, occlusion, or hypotony

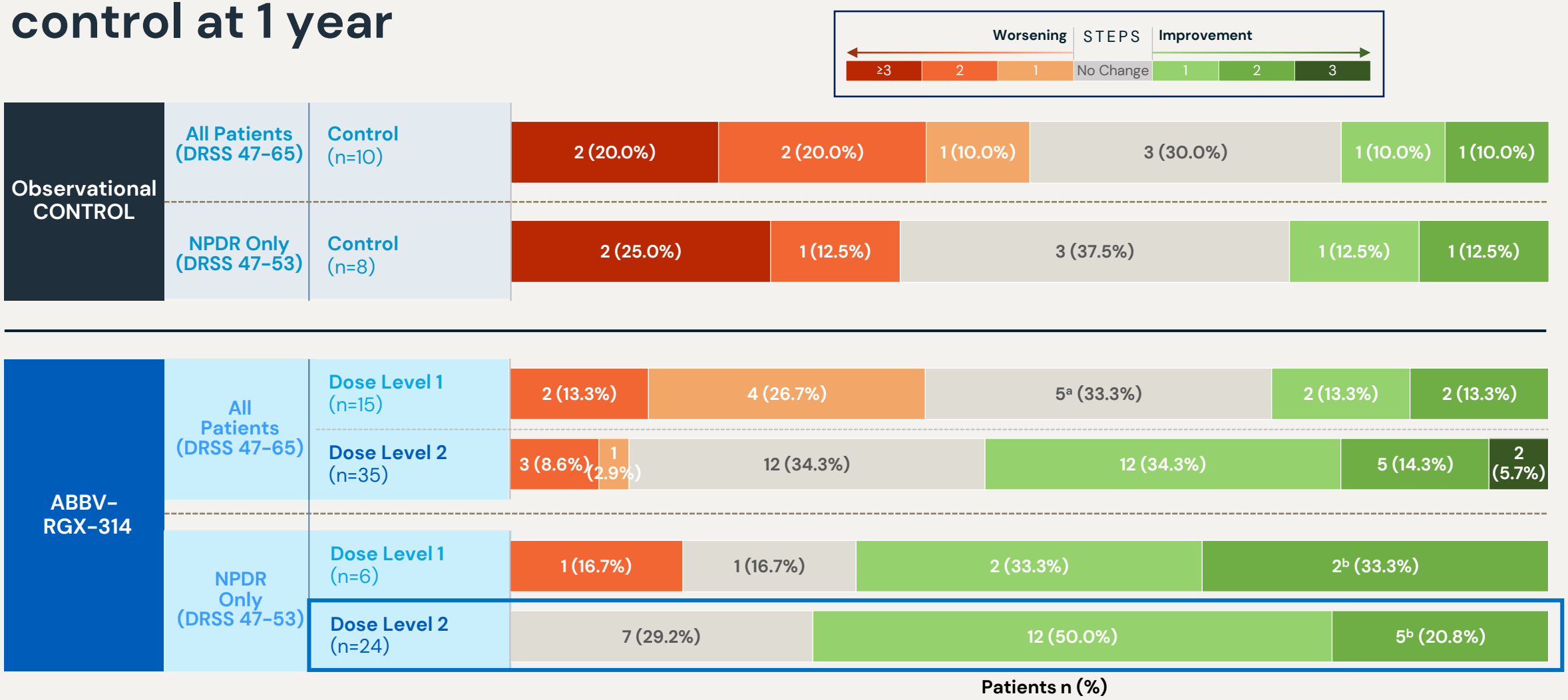
Dose Levels 1 and 2: Common Ocular TEAEs[a] in the Study Eye through 1 Year	No prophylactic steroids		
	Dose Level 1 $2.5x10^{11}$ (C1) (N=15)	Dose Level 2 $5x10^{11}$ (C2/C3) (N=35)	Total N=50
Conjunctival hyperemia	4 (26.7%)	11 (31.4%)	15 (30.0%)
Conjunctival hemorrhage	3 (20.0%)	4 (11.4%)	7 (14.0%)
Episcleritis[b]	1 (6.7%)	5 (14.3%)	6 (12.0%)
IOP Increase	1 (6.7%)	3 (8.6%)	4 (8.0%)
Intraocular Inflammation [c]	0 (0.0%)	3 (8.6%)	3 (6.0%)

Stable BCVA through One Year

Data cut: September 25, 2023

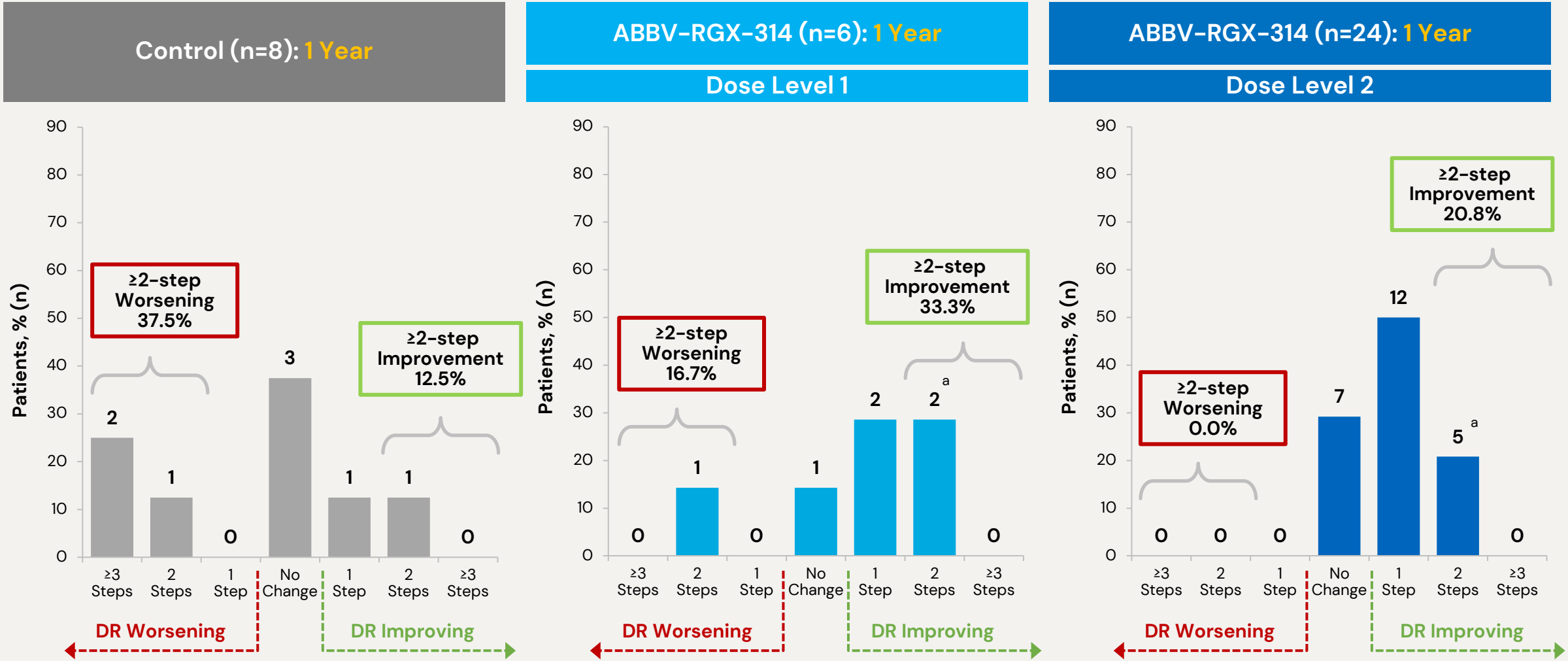
1. Common TEAEs include AEs for total group ≥10%, as well as IOP increase and intraocular inflammation, with onset up to the 1 Year visit.
2. b. All cases were mild to moderate (grade 1 and grade 2) and have resolved on topical corticosteroids based on slit lamp examination.
3. c. All cases were mild (range +0.5 to +1) and most presented 2-6 weeks post injection, predominantly as anterior cells on slit lamp examination. Resolved on topical corticosteroids.
4. SAE: Serious Adverse Event; TEAE: Treatment Emergent Adverse Event.

Summary of DRSS change with dose levels 1 and 2 compared to control at 1 year



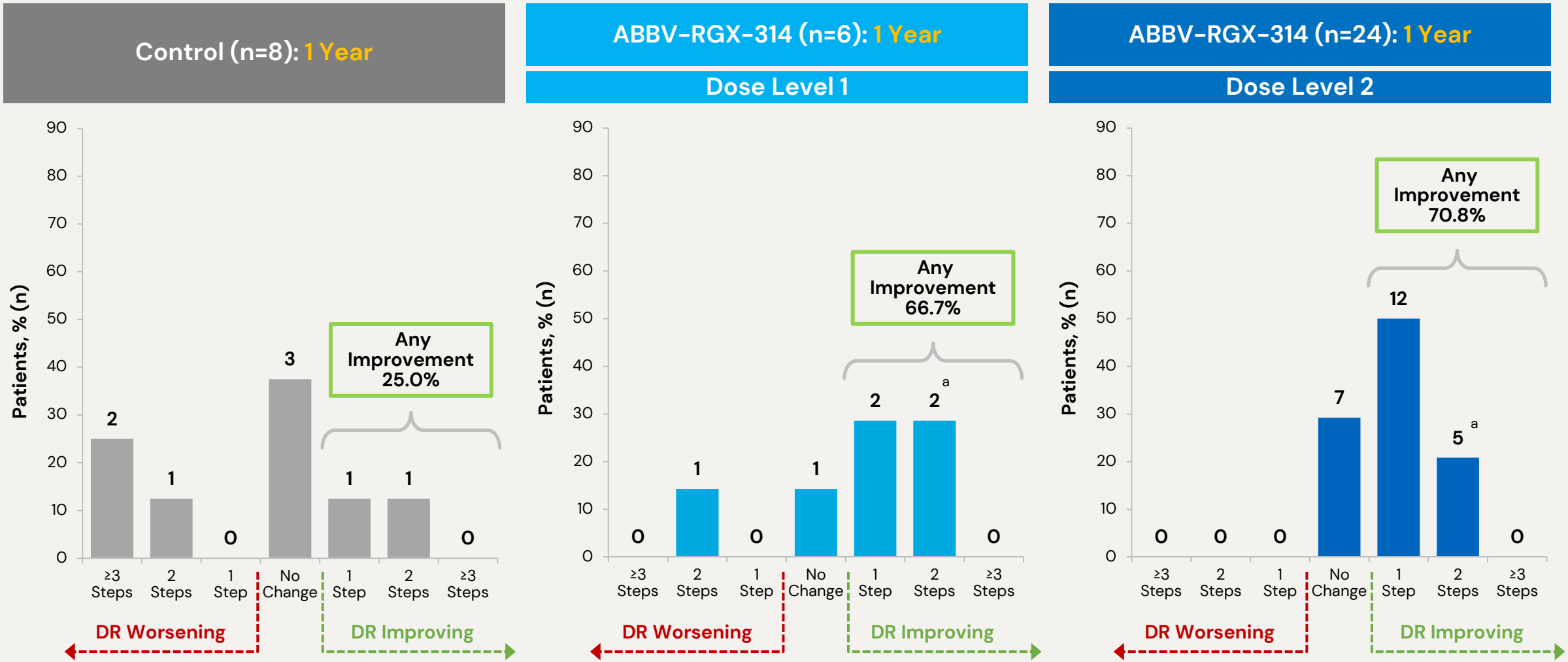
a. Data cut: September 25, 2023.
a. During an interim central reading center masked adjudication, 1 patient's DRSS grade at baseline was updated from Grade 47 to Grade 65.
b. One patient in each Dose Level missed their 1-Year visit, so their 6-month results were used.

Change in DRSS at 1 year by dose level – NPDR only (DRSS 47–53)



Data cut: September 25, 2023.
a. One patient in each Dose Level missed their 1-Year visit, so their 6-month results were used.

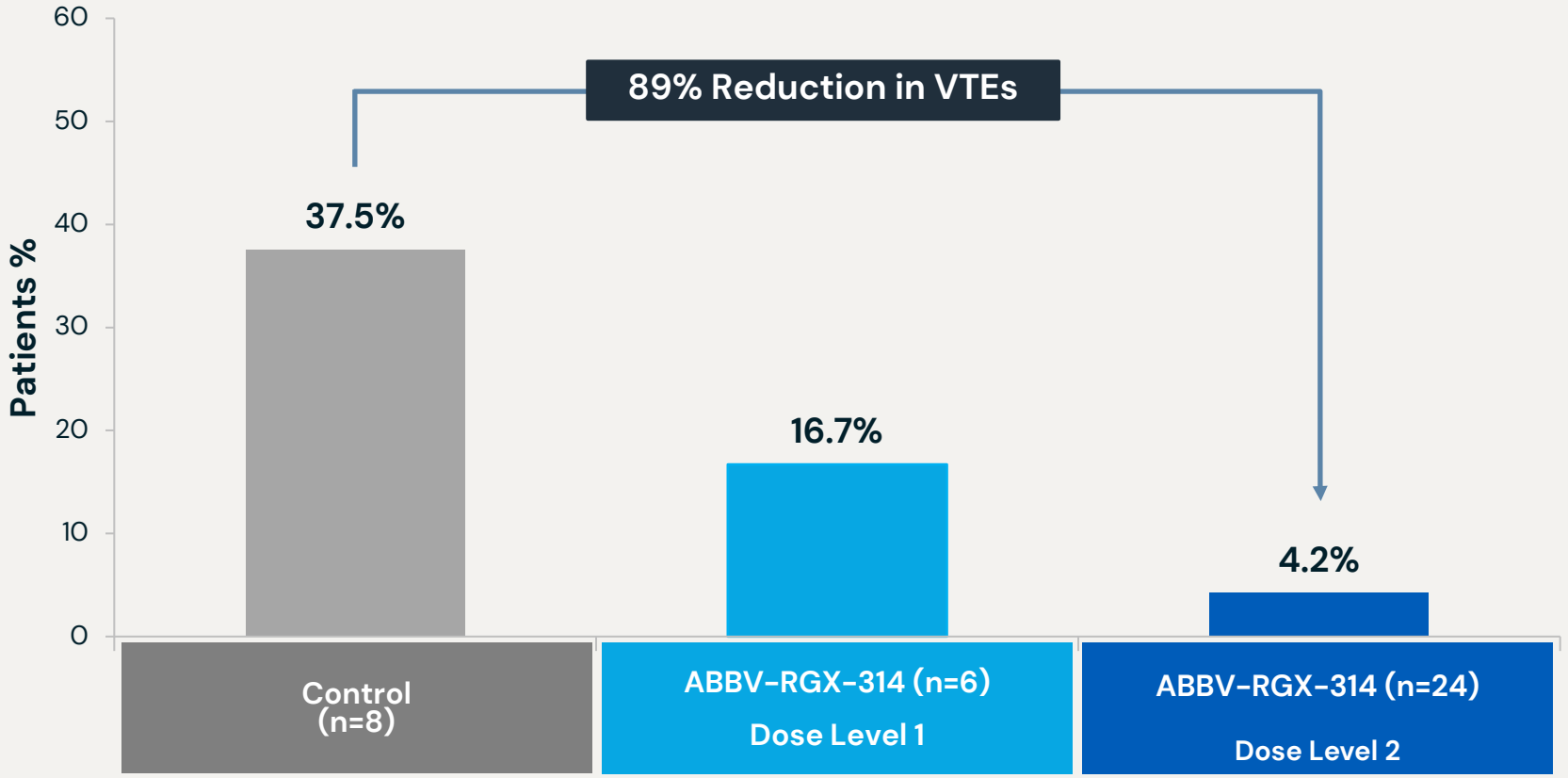
Change in DRSS at 1 year by dose level – NPDR only (DRSS 47–53)



Data cut: September 25, 2023.
a. One patient in each Dose Level missed their 1-Year visit, so their 6-month results were used.

Vision-threatening events (VTEs) through year 1 by dose level – NPDR only (DRSS 47-53)

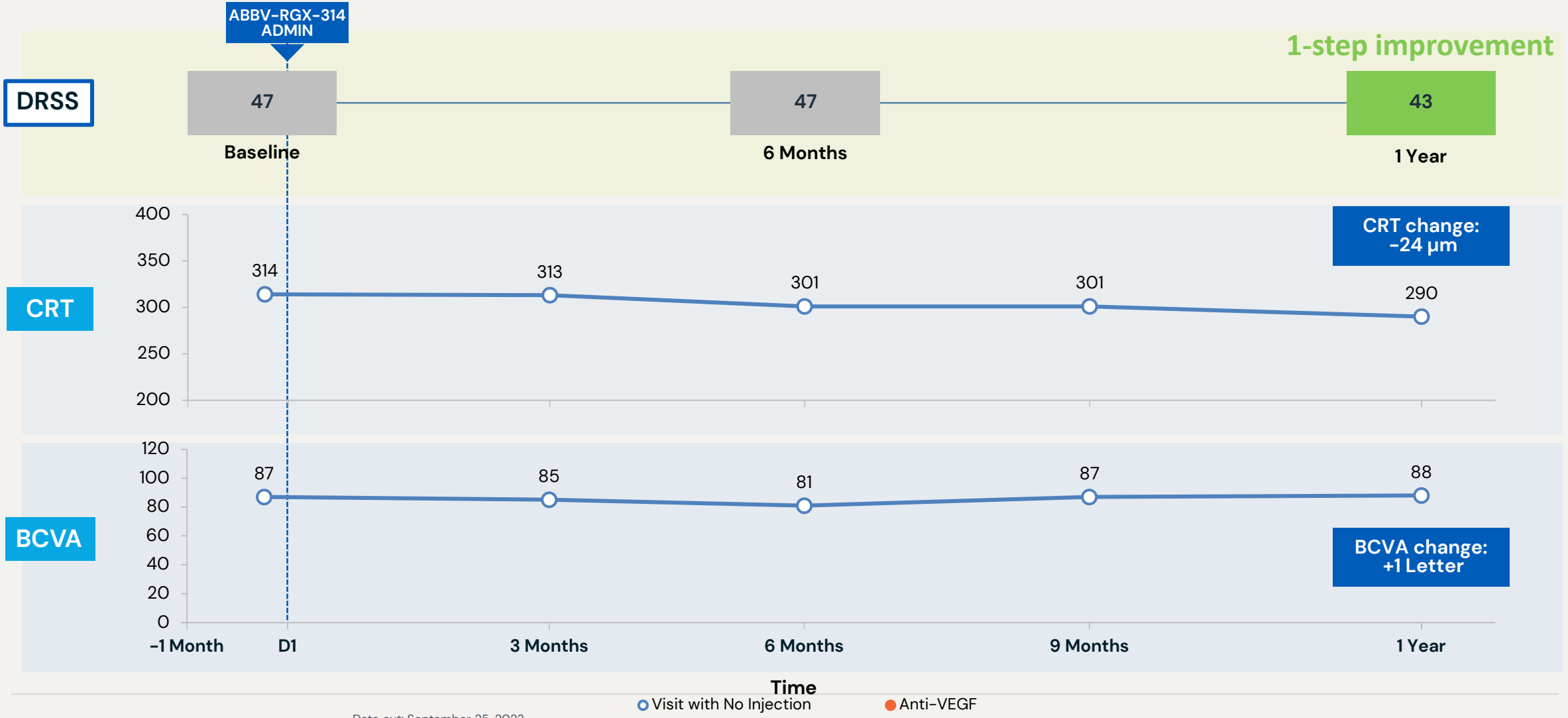
ABBV-RGX-314 treatment reduced VTEs compared to control group through 1 year



Data cut: September 25, 2023.
CI-DME: Center-Involved Diabetic Macular Edema; PDR: Proliferative Diabetic Retinopathy; ASNV: Anterior Segment Neovascularization; VTCs: Vision-Threatening Complications; VTEs: Vision-Threatening Events
VTEs = VTCs + CI-DME; VTCs could include PDR or ASNV. No cases of ASNV were reported.

Patient A: 65yo male that received dose level 2 of ABBV-RGX-314

DRSS, CRT, and BCVA change over time

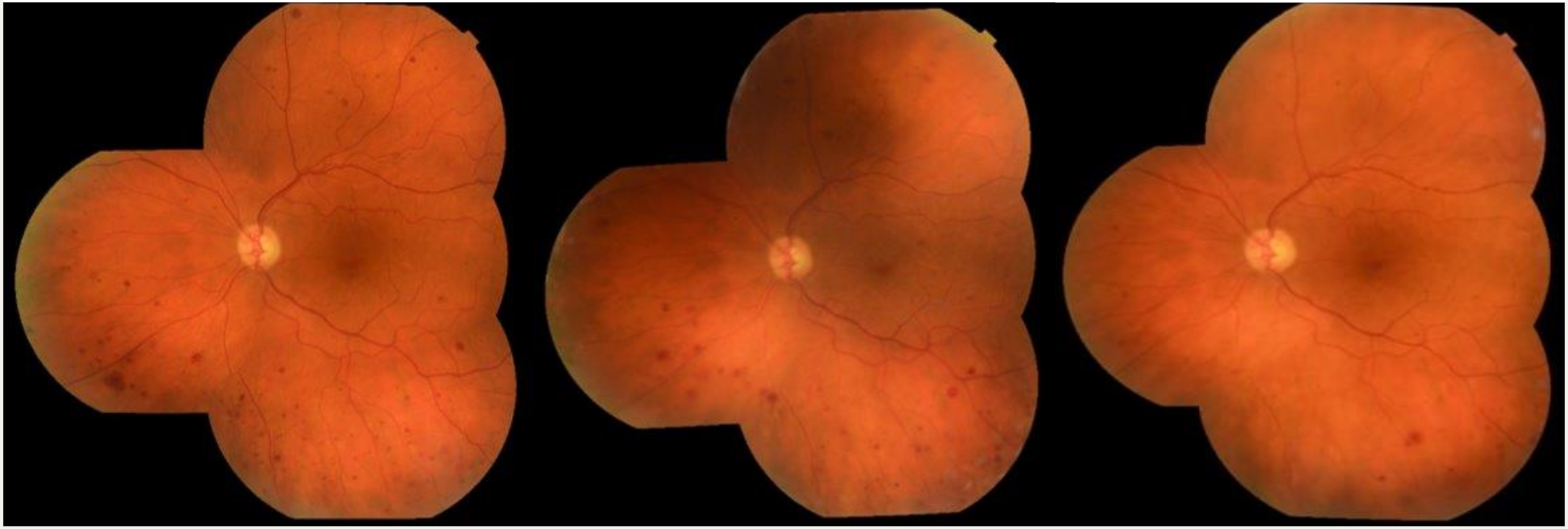


Data cut: September 25, 2023.
This slide presents results from an individual patient and is not indicative of outcomes experienced by all patients in this trial.
DRSS: Diabetic Retinopathy Severity Scale; CRT: Central Retinal Thickness; BCVA: Best Corrected Visual Acuity

Patient A: 65 yo male that received dose level 2 of ABBV-RGX-314

DRSS 1-Step Improvement (47 to 43) at 1 Year

Baseline **DRSS 47**	Month 6 **DRSS 47**	Year 1 **DRSS 43**



Data cut: September 25, 2023.
This slide presents results from an individual patient and is not indicative of outcomes experienced by all patients in this trial.
DRSS: Diabetic Retinopathy Severity Scale

Summary of ABBV-RGX-314 1 year results from the phase II ALTITUDE® DR study: dose levels 1 and 2

- **Safety**
  - Suprachoroidal ABBV-RGX-314 continues to be **well-tolerated in dose levels 1 and 2 (n=50) through 1 year**
  - No prophylactic corticosteroids administered in dose levels 1 and 2
  - A few cases of mild intraocular inflammation were observed; resolved with topical corticosteroids
- **Efficacy Endpoints**
  - **One-time in-office injection** of investigational ABBV-RGX-314 demonstrated clinically meaningful improvements in disease severity and reduction of VTEs in NPDR patients
  - **In Dose Level 2 patients with baseline NPDR (n=24):**
    - **100%** demonstrated stable to improved disease severity
      - 70.8% achieved any disease improvement vs. 25.0 % in Control
      - 0% worsened ≥2 steps vs. 37.5 % in Control
    - 4.2% developed VTEs vs. 37.5% in Control

Dose Level 2 prevented disease progression in all NPDR patients and reduced vision-threatening events by 89%

REGENXBIO

Data cut: September 25, 2023.
VTEs: Vision-Threatening Events = VTCs + CI-DME