



## Clinical trial results:

**A 12-week treatment, multi-center, randomized, double-blind, parallel-group, placebo and active controlled study to assess the efficacy, safety, and tolerability of indacaterol maleate / glycopyrronium bromide in COPD patients with moderate to severe airflow limitation.**

### Summary

EudraCT number	2012-003346-32
Trial protocol	ES PL
Global end of trial date	28 February 2014

### Results information

Result version number	v1 (current)
This version publication date	13 July 2016
First version publication date	25 July 2015

### Trial information

#### Trial identification

Sponsor protocol code	CQVA149A2336
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#### Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT01727141
WHO universal trial number (UTN)	-

Notes:

### Sponsors

Sponsor organisation name	Novartis Pharmaceuticals AG, CH-4002, Basel, Switzerland
Sponsor organisation address	CH-4002, Basel, Switzerland,
Public contact	Novartis Pharmaceuticals AG, Novartis Pharmaceuticals AG, Novartis Pharmaceuticals AG, Novartis Pharmaceuticals AG, 41 613241111,
Scientific contact	Novartis Pharmaceuticals AG, Novartis Pharmaceuticals AG, Novartis Pharmaceuticals AG, Novartis Pharmaceuticals AG, 41 613241111,

Notes:

### Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	No

Notes:

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**Results analysis stage**

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Analysis stage	Final
Date of interim/final analysis	28 February 2014
Is this the analysis of the primary completion data?	Yes
Primary completion date	28 February 2014
Global end of trial reached?	Yes
Global end of trial date	28 February 2014
Was the trial ended prematurely?	No

Notes:

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**General information about the trial**

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Main objective of the trial:

To demonstrate the superiority of QVA149 27.5/12.5 ug b.i.d. compared to monotherapy components, QAB149 27.5 ug b.i.d and NVA237 12.5 ug b.i.d., in terms of standardized FEV1 AUC0-12 h at week 12. Eligible patients were provided a short acting  $\beta$ 2-agonist (salbutamol or albuterol) for use as a rescue inhaler on an "as needed" basis throughout the study.

Protection of trial subjects:

The study was in compliance with the ethical principles derived from the Declaration of Helsinki and the International Conference on Harmonization (ICH) Good Clinical Practice (GCP) guidelines. All the local regulatory requirements pertinent to safety of trial subjects were also followed during the conduct of the trial.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	28 November 2012
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	No

Notes:

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**Population of trial subjects**

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**Subjects enrolled per country**

Country: Number of subjects enrolled	Canada: 126
Country: Number of subjects enrolled	Philippines: 26
Country: Number of subjects enrolled	Poland: 28
Country: Number of subjects enrolled	Romania: 101
Country: Number of subjects enrolled	Spain: 96
Country: Number of subjects enrolled	Ukraine: 147
Country: Number of subjects enrolled	United States: 510
Country: Number of subjects enrolled	Vietnam: 8
Worldwide total number of subjects	1042
EEA total number of subjects	225

Notes:

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**Subjects enrolled per age group**

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In utero	0
Preterm newborn - gestational age < 37	0

wk	
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	0
Children (2-11 years)	0
Adolescents (12-17 years)	0
Adults (18-64 years)	558
From 65 to 84 years	481
85 years and over	3

## Subject disposition

### Recruitment

Recruitment details:

Participants were randomized to each treatment arm in a 1:1:1:1 ratio.

### Pre-assignment

Screening details:

One thousand forty two participants were randomized. (One participant was randomized twice and was counted twice in the randomized set.) In the safety set, participants were analyzed according to the treatment received.

### Period 1

Period 1 title	Overall Study (overall period)
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Double blind
Roles blinded	Subject, Investigator

### Arms

Are arms mutually exclusive?	Yes
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<b>Arm title</b>	QVA149
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Arm description:

27.5/12.5 ug twice daily (b.i.d) Single Dose Dry Powder Inhaler (SDDPI)

Arm type	Experimental
Investigational medicinal product name	QVA149
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Capsule
Routes of administration	Inhalation use

Dosage and administration details:

27.5/12.5 ug twice daily (b.i.d.) Single Dose Dry Powder Inhaler (SDDPI)

<b>Arm title</b>	QAB149
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Arm description:

27.5 ug b.i.d.

Arm type	Active comparator
Investigational medicinal product name	QAB149
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Capsule
Routes of administration	Inhalation use

Dosage and administration details:

27.5 ug b.i.d.

<b>Arm title</b>	NVA237
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Arm description:

12.5 ug b.i.d.

Arm type	Active comparator
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Investigational medicinal product name	NVA237
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Capsule
Routes of administration	Inhalation use

Dosage and administration details:

12.5 ug b.i.d.

<b>Arm title</b>	Placebo
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Arm description:

b.i.d

Arm type	Placebo
Investigational medicinal product name	Placebo
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Capsule
Routes of administration	Inhalation use

Dosage and administration details:

b.i.d.

<b>Number of subjects in period 1</b>	QVA149	QAB149	NVA237
Started	260	260	261
Full analysis set	258	260	261
Safety set	258	260	261
Completed	255	251	258
Not completed	5	9	3
Adverse event, serious fatal	-	1	1
Consent withdrawn by subject	4	4	2
Physician decision	-	1	-
Protocol deviation	1	1	-
Lost to follow-up	-	2	-

<b>Number of subjects in period 1</b>	Placebo
Started	261
Full analysis set	261
Safety set	260
Completed	246
Not completed	15
Adverse event, serious fatal	1
Consent withdrawn by subject	11
Physician decision	2
Protocol deviation	1
Lost to follow-up	-



## Baseline characteristics

### Reporting groups

Reporting group title	QVA149
Reporting group description:	27.5/12.5 ug twice daily (b.i.d) Single Dose Dry Powder Inhaler (SDDPI)
Reporting group title	QAB149
Reporting group description:	27.5 ug b.i.d.
Reporting group title	NVA237
Reporting group description:	12.5 ug b.i.d.
Reporting group title	Placebo
Reporting group description:	b.i.d

Reporting group values	QVA149	QAB149	NVA237
Number of subjects	260	260	261
Age categorical Units: Subjects			
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
Adults (18-64 years)	132	143	140
From 65-84 years	126	116	121
85 years and over	2	1	0
Age Continuous   Units: Years			
arithmetic mean	63.9	63.7	63.7
standard deviation	± 8.76	± 8.07	± 8.35
Gender, Male/Female Units: Participants			
Female	90	74	78
Male	170	186	183

Reporting group values	Placebo	Total	
Number of subjects	261	1042	
Age categorical Units: Subjects			
In utero	0	0	
Preterm newborn infants (gestational age < 37 wks)	0	0	
Newborns (0-27 days)	0	0	
Infants and toddlers (28 days-23 months)	0	0	

Children (2-11 years)	0	0	
Adolescents (12-17 years)	0	0	
Adults (18-64 years)	143	558	
From 65-84 years	118	481	
85 years and over	0	3	
Age Continuous   Units: Years arithmetic mean standard deviation	63.7 ± 8.19	-	
Gender, Male/Female Units: Participants			
Female	92	334	
Male	169	708	



## End points

### End points reporting groups

Reporting group title	QVA149
Reporting group description: 27.5/12.5 ug twice daily (b.i.d) Single Dose Dry Powder Inhaler (SDDPI)	
Reporting group title	QAB149
Reporting group description: 27.5 ug b.i.d.	
Reporting group title	NVA237
Reporting group description: 12.5 ug b.i.d.	
Reporting group title	Placebo
Reporting group description: b.i.d	

### Primary: Change from baseline in standardized forced expiratory volume in 1 second (FEV1) Area Under the Curve (AUC) (0-12 hours (h))

End point title	Change from baseline in standardized forced expiratory volume in 1 second (FEV1) Area Under the Curve (AUC) (0-12 hours (h))
End point description: Pulmonary function assessments were performed using centralized spirometry according to international standards. Baseline FEV1 was defined as the average of the pre-dose FEV1 measured at -45 minutes (min) and -15 min at day 1. A mixed model for repeated measures (MMRM), used for this analysis, included terms of treatment, baseline FEV1 measurements, smoking status at baseline, baseline inhaled corticosteroid (ICS) use, region, baseline FEV1 * visit interaction, and visit, treatment * visit interaction. Missing values of FEV1 AUC0-12 at Day 1 and Week 12 will not imputed. The trapezoidal rule was used to calculate FEV1 AUC and then normalized to the length of time.	
End point type	Primary
End point timeframe: baseline (BL), 12 Weeks	

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	258	260	261	260
Units: Liter				
least squares mean (standard error)	0.211 (± 0.014)	0.117 (± 0.014)	0.112 (± 0.0141)	-0.021 (± 0.0145)

### Statistical analyses

Statistical analysis title	FEV1 (L) AUC(0-12h) change from baseline
Comparison groups	QAB149 v QVA149

Number of subjects included in analysis	518
Analysis specification	Pre-specified
Analysis type	superiority
P-value	< 0.001
Method	Mixed model for repeated measures (MMRM)

<b>Statistical analysis title</b>	FEV1 (L) AUC(0-12h) change from baseline
Comparison groups	QVA149 v NVA237
Number of subjects included in analysis	519
Analysis specification	Pre-specified
Analysis type	superiority
P-value	< 0.001
Method	Mixed model for repeated measures (MMRM)

## Secondary: Change from baseline in St. George's Respiratory Questionnaire (SGRQ) total score

End point title	Change from baseline in St. George's Respiratory Questionnaire (SGRQ) total score
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### End point description:

Participants reported change in health status by using the SGRQ. The SGRQ contains 50 items divided into 2 parts covering 3 aspects of health related to COPD: Part I covers "Symptoms" and is concerned with respiratory symptoms, their frequency and severity; Part II covers "Activity" and is concerned with activities that cause or are limited by breathlessness; Part II is also concerned with "Impacts", which covers a range of aspects concerned with social functioning and psychological disturbances resulting from airways disease. A score was calculated for each of these 3 subscales and a "Total" score was calculated. In each case the lowest possible value is zero and the highest 100. Higher values correspond to greater impairment of health status. Missing week 12 data were imputed with Last Observation Carried Forward (LOCF) method but only if measured at day  $\geq 29$ . A negative change from baseline indicates improvement.

End point type	Secondary
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### End point timeframe:

BL, 12 Weeks

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	246	244	243	223
Units: score on a scale				
least squares mean (standard error)	-6.4 ( $\pm 0.75$ )	-4.6 ( $\pm 0.75$ )	-4.8 ( $\pm 0.75$ )	-2.7 ( $\pm 0.78$ )

## Statistical analyses

No statistical analyses for this end point

## Secondary: Percentage of participants with a clinically important improvement of at

**least 4 units in the SGRQ total score**

End point title	Percentage of participants with a clinically important improvement of at least 4 units in the SGRQ total score
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## End point description:

Participants reported change in health status by using the SGRQ. The SGRQ contains 50 items divided into 2 parts covering 3 aspects of health related to COPD: Part I covers "Symptoms" and is concerned with respiratory symptoms, their frequency and severity; Part II covers "Activity" and is concerned with activities that cause or are limited by breathlessness; Part II is also concerned with "Impacts", which covers a range of aspects concerned with social functioning and psychological disturbances resulting from airways disease. A score was calculated for each of these 3 subscales and a "Total" score was calculated. In each case the lowest possible value is zero and the highest 100. Higher values correspond to greater impairment of health status.

End point type	Secondary
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## End point timeframe:

12 weeks

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	246	244	243	223
Units: Percentage of participants				
number (not applicable)	57.3	48	46.1	39

**Statistical analyses**

No statistical analyses for this end point

**Secondary: Change from baseline in trough FEV1**

End point title	Change from baseline in trough FEV1
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## End point description:

Pulmonary function assessments were performed using centralized spirometry according to international standards. Trough FEV1 was analyzed using the same MMRM as specified for FEV1. Trough FEV1 was defined as the mean of FEV1 at 23 h 15 min and 23 h 45 min after the morning dose of the previous day. Before the mean was calculated, a time window of 10 – 13 hours post-evening dose was applied to these 2 measurements. Recordings outside the time window were set to missing.

End point type	Secondary
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## End point timeframe:

BL, day 2, day 86

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	256	257	260	252
Units: Liters				
least squares mean (standard error)				
day 2	0.187 (± 0.0102)	0.109 (± 0.0102)	0.112 (± 0.0101)	0.015 (± 0.0103)

day 86	0.201 ( $\pm$ 0.0144)	0.12 ( $\pm$ 0.0142)	0.092 ( $\pm$ 0.0142)	-0.012 ( $\pm$ 0.015)
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## Statistical analyses

No statistical analyses for this end point

### Secondary: Change from baseline in pre-dose trough FEV1

End point title	Change from baseline in pre-dose trough FEV1
End point description: Pulmonary function assessments were performed using centralized spirometry according to international standards. Pre-dose trough FEV1 was analyzed using the same MMRM as specified for FEV1. Pre-dose trough FEV1 was defined as the mean of FEV1 at -45 min and -15 min before the morning dose. Since the time of evening dose of the previous day was not recorded at these visits, no time window was applied.	
End point type	Secondary
End point timeframe: BL, day 85	

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	254	254	257	244
Units: Liters				
least squares mean (standard error)	0.161 ( $\pm$ 0.014)	0.083 ( $\pm$ 0.014)	0.061 ( $\pm$ 0.014)	-0.035 ( $\pm$ 0.0145)

## Statistical analyses

No statistical analyses for this end point

### Secondary: Change from baseline in FEV1

End point title	Change from baseline in FEV1
End point description: Pulmonary function assessments were performed using centralized spirometry according to international standards. Baseline FEV1 was defined as the average of the pre-dose FEV1 measured at -45 minutes (min) and -15 min at day 1. A mixed model for repeated measures (MMRM), used for this analysis, included terms of treatment, baseline FEV1 measurements, smoking status at baseline, baseline inhaled corticosteroid (ICS) use, region, baseline FEV1 * visit interaction, and visit, treatment * visit interaction.	
End point type	Secondary
End point timeframe: BL, Day 1: 5min, 15min, 1h, 2h, 4h, 6h, 8h, 11h55 min; Day 2: 23h15min, 23h45min; Day 15: -45min, -15min, 1h; Day 29: -45 min, -15min, 1h; Day 57: -45min, -15min, 1h; Day 85: -45min, -15min, 5min, 15min, 1h, 2h, 4h, 6h, 8h, 11h55min; Day 86: 23h15min; 23h45min	

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	258	260	261	261
Units: Liters				
least squares mean (standard error)				
Day 1, 5 min (n=255,257,260,255)	0.111 (± 0.0062)	0.071 (± 0.0062)	0.065 (± 0.0062)	0.009 (± 0.0062)
Day 1, 15 min (n=256,256,261,258)	0.146 (± 0.007)	0.088 (± 0.007)	0.117 (± 0.0069)	0.012 (± 0.007)
Day 1, 1 h (n=258,260,261,258)	0.179 (± 0.0082)	0.085 (± 0.0082)	0.166 (± 0.0081)	0.016 (± 0.0082)
Day 1, 2 h (n=254,257,261,254)	0.219 (± 0.0091)	0.104 (± 0.0091)	0.179 (± 0.0089)	0.037 (± 0.009)
Day 1, 4 h (n=252,260,256,254)	0.207 (± 0.0103)	0.105 (± 0.0103)	0.146 (± 0.0101)	0.039 (± 0.0103)
Day 1, 6 h (n=253,256,254,248)	0.178 (± 0.0105)	0.102 (± 0.0105)	0.125 (± 0.0104)	0.021 (± 0.0107)
Day 1, 8 h (n=253,251,256,248)	0.157 (± 0.01)	0.081 (± 0.0102)	0.106 (± 0.0101)	0.004 (± 0.0104)
Day 1, 11 h (n=246,250,253,245)	0.116 (± 0.0112)	0.047 (± 0.0112)	0.073 (± 0.0111)	-0.02 (± 0.0113)
Day 2, 23h 15 min (n=249,249,254,242)	0.176 (± 0.0106)	0.104 (± 0.0106)	0.106 (± 0.0104)	0.004 (± 0.0107)
Day 2, 23h 45min (n=255,254,258,250)	0.194 (± 0.0108)	0.119 (± 0.0109)	0.119 (± 0.0107)	0.022 (± 0.011)
Day 15, -45min (n=254,254,256,244)	0.168 (± 0.0123)	0.114 (± 0.0124)	0.067 (± 0.0122)	-0.023 (± 0.0126)
Day 15, -15 min (n=254,254,256,243)	0.185 (± 0.0125)	0.139 (± 0.0126)	0.087 (± 0.0125)	-0.008 (± 0.0129)
Day 15, 1 h (n=258,260,261,258)	0.269 (± 0.0133)	0.173 (± 0.0134)	0.161 (± 0.0133)	0.004 (± 0.0136)
Day 29, -45 min (n=254,254,256,244)	0.175 (± 0.0123)	0.111 (± 0.0124)	0.073 (± 0.0123)	-0.029 (± 0.0126)
Day 29, -15 min (n=254,254,256,243)	0.193 (± 0.0128)	0.131 (± 0.0127)	0.092 (± 0.0127)	-0.006 (± 0.013)
Day 29, 1 h (n=258,260, 261,258)	0.271 (± 0.0135)	0.167 (± 0.0135)	0.156 (± 0.0135)	0.006 (± 0.0138)
Day 57, -45 min (n=254,254,256,244)	0.181 (± 0.0134)	0.097 (± 0.0134)	0.069 (± 0.0133)	-0.016 (± 0.0137)
Day 57, -15 min (n=254,254,256,243)	0.193 (± 0.0132)	0.117 (± 0.0132)	0.094 (± 0.0132)	0.006 (± 0.0136)
Day 57, 1 h (n=258,260,261,258)	0.273 (± 0.0141)	0.15 (± 0.0141)	0.161 (± 0.014)	0.008 (± 0.0144)
Day 85, -45 min (n= 254,254,256,244)	0.154 (± 0.0142)	0.08 (± 0.0142)	0.051 (± 0.0142)	-0.038 (± 0.0146)
Day 85, -15 min (n=254,254,256,243)	0.171 (± 0.0144)	0.088 (± 0.0144)	0.073 (± 0.0143)	-0.035 (± 0.0149)
Day 85, 5 min (n=255,257,260,255)	0.232 (± 0.0147)	0.119 (± 0.0148)	0.106 (± 0.0149)	-0.036 (± 0.0154)
Day 85, 15 min (n=256,256,261,258)	0.242 (± 0.015)	0.143 (± 0.0151)	0.13 (± 0.0152)	-0.02 (± 0.0159)
Day 85, 1 h (n=258,260,261,258)	0.25 (± 0.0149)	0.136 (± 0.0149)	0.15 (± 0.015)	-0.021 (± 0.0154)
Day 85, 2 h 9n=254,257,261,254)	0.265 (± 0.015)	0.145 (± 0.015)	0.171 (± 0.0151)	-0.009 (± 0.0157)

Day 85, 4 h (n=252,260,256,254)	0.242 (± 0.0158)	0.14 (± 0.0155)	0.132 (± 0.0158)	-0.001 (± 0.0165)
Day 85, 6 h (n=253,256,254,248)	0.197 (± 0.0154)	0.123 (± 0.0155)	0.109 (± 0.0157)	-0.017 (± 0.0162)
Day 85, 8 h (n=253,251,256,248)	0.18 (± 0.0152)	0.103 (± 0.0152)	0.086 (± 0.0151)	-0.03 (± 0.0158)
Day 85, 11 h 55min(n=246,250,253,245)	0.143 (± 0.0155)	0.066 (± 0.0154)	0.055 (± 0.015)	-0.064 (± 0.0161)
Day 86, 23 h 15 min (n=249,249,254,242)	0.196 (± 0.0149)	0.116 (± 0.0151)	0.082 (± 0.0151)	-0.017 (± 0.0155)
Day 86, 23 h 45 min (n=255,254,258,250)	0.216 (± 0.0144)	0.128 (± 0.0144)	0.1 (± 0.0143)	-0.004 (± 0.015)

## Statistical analyses

No statistical analyses for this end point

## Secondary: Change from baseline in FVC

End point title	Change from baseline in FVC
End point description:	
Pulmonary function assessments were performed using centralized spirometry according to international standards. Baseline FVC was defined as the average of the pre-dose FVC measured at -45 minutes (min) and -15 min at day 1. A mixed model for repeated measures (MMRM), used for this analysis, included terms of treatment, baseline FVC measurements, smoking status at baseline, baseline inhaled corticosteroid (ICS) use, region, baseline FEV1 * visit interaction, and visit, treatment * visit interaction.	
End point type	Secondary
End point timeframe:	
BL, Day 1: 5min, 15min, 1h, 2h, 4h, 6h, 8h, 11h55 min;Day 2: 23h15min, 23h45min;Day 15: -45min, -15min, 1h;Day 29: -45 min, -15min, 1h;Day 57: -45min, -15min, 1h;Day 85: -45min, -15min, 5min, 15min, 1h, 2h, 4h, 6h, 8h, 11h 55min;Day 86: 23h15min; 23h45min	

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	258	260	261	261
Units: Liters				
least squares mean (standard error)				
Day 1, 5 min (n=255,257,260,255)	0.234 (± 0.0131)	0.175 (± 0.0132)	0.136 (± 0.0131)	0.009 (± 0.0131)
Day 1, 15 min (n=256,256,261,258)	0.283 (± 0.0146)	0.2 (± 0.0146)	0.243 (± 0.0145)	0.032 (± 0.0146)
Day 1, 1 h (n=258,260,261,258)	0.329 (± 0.0165)	0.191 (± 0.0164)	0.292 (± 0.0163)	0.029 (± 0.0164)
Day 1, 2 h (n=254,257,261,254)	0.39 (± 0.018)	0.22 (± 0.018)	0.306 (± 0.0177)	0.076 (± 0.0178)
Day 1, 4 h (n=252,260,256,254)	0.355 (± 0.0192)	0.209 (± 0.0192)	0.253 (± 0.019)	0.072 (± 0.0192)
Day 1, 6 h (n=253,256,254,248)	0.319 (± 0.0198)	0.214 (± 0.0198)	0.23 (± 0.0197)	0.043 (± 0.0202)
Day 1, 8 h (n=253,251,256,248)	0.306 (± 0.0189)	0.188 (± 0.0192)	0.195 (± 0.0189)	0.04 (± 0.0195)
Day 1, 11 h 55 min(n=246,250,253,245)	0.24 (± 0.0208)	0.122 (± 0.0208)	0.14 (± 0.0207)	-0.019 (± 0.021)

Day 2, 23 h 15 min (n=249,249,254,242)	0.315 (± 0.0194)	0.214 (± 0.0193)	0.19 (± 0.019)	0.013 (± 0.0196)
Day 2, 23 h 45 min (n=255,254,258,250)	0.337 (± 0.02)	0.232 (± 0.0203)	0.201 (± 0.0198)	0.056 (± 0.023)
Day 15, -45 min (n=254,254,256,244)	0.265 (± 0.0227)	0.188 (± 0.0229)	0.134 (± 0.0225)	-0.016 (± 0.0232)
Day 15, -15 min (n=254,254,256,243)	0.307 (± 0.0234)	0.206 (± 0.0236)	0.167 (± 0.0233)	0.032 (± 0.0241)
Day 15, 1 h (n=258,260,261,258)	0.419 (± 0.0241)	0.274 (± 0.0242)	0.269 (± 0.0241)	0.034 (± 0.0246)
Day 29, -45 min (n=254,254,256,244)	0.276 (± 0.0225)	0.177 (± 0.0226)	0.142 (± 0.0224)	-0.022 (± 0.0231)
Day 29, -15 min (n=254,254,256,243)	0.304 (± 0.0228)	0.203 (± 0.0228)	0.168 (± 0.0227)	0.017 (± 0.0233)
Day 29, 1 h (n=258,260,261,258)	0.422 (± 0.0243)	0.259 (± 0.0244)	0.272 (± 0.0243)	0.046 (± 0.0248)
Day 57, -45 min (n=254,254,256,244)	0.286 (± 0.0235)	0.153 (± 0.0236)	0.124 (± 0.0234)	-0.026 (± 0.024)
Day 57, -15 min (n=254,254,256,243)	0.299 (± 0.0234)	0.177 (± 0.0234)	0.172 (± 0.0234)	0.022 (± 0.0241)
Day 57, 1 h (n=258,260,261,258)	0.411 (± 0.0241)	0.239 (± 0.0241)	0.265 (± 0.024)	0.03 (± 0.0246)
Day 85, -45 min (n=254,254,256,244)	0.247 (± 0.0245)	0.106 (± 0.0245)	0.092 (± 0.0245)	-0.055 (± 0.0252)
Day 85, -15 min (n=254,254,256,243)	0.264 (± 0.0246)	0.129 (± 0.0247)	0.134 (± 0.0245)	-0.058 (± 0.0255)
Day 85, 5 min (n=255,257,260,255)	0.35 (± 0.0253)	0.192 (± 0.0255)	0.179 (± 0.0255)	-0.031 (± 0.0265)
Day 85, 15 min (n=256,256,261,258)	0.378 (± 0.025)	0.226 (± 0.0252)	0.226 (± 0.0252)	-0.011 (± 0.0263)
Day 85, 1 h (n=258,260,261,258)	0.366 (± 0.025)	0.2 (± 0.025)	0.243 (± 0.0251)	-0.024 (± 0.0257)
Day 85, 2 h (n=254,257,261,254)	0.38 (± 0.0255)	0.222 (± 0.0255)	0.285 (± 0.0255)	0.012 (± 0.0265)
Day 85, 4 h (n=252,260,256,254)	0.326 (± 0.026)	0.201 (± 0.0255)	0.203 (± 0.0259)	0.008 (± 0.027)
Day 85, 6 h (n=253,256,254,248)	0.29 (± 0.0263)	0.164 (± 0.0265)	0.176 (± 0.0268)	-0.033 (± 0.0276)
Day 85, 8h (n=253,251,256,248)	0.263 (± 0.0259)	0.154 (± 0.0259)	0.155 (± 0.0258)	-0.035 (± 0.0269)
Day 85, 11 55 min (n=246,250,253,245)	0.209 (± 0.0261)	0.109 (± 0.0259)	0.11 (± 0.0253)	-0.071 (± 0.0271)
Day 86, 23 h 15 min (n=249,249,254,242)	0.295 (± 0.025)	0.16 (± 0.0254)	0.142 (± 0.0253)	-0.007 (± 0.0259)
Day 86, 23 h 45 min (n=255,254,258,250)	0.315 (± 0.0243)	0.186 (± 0.0242)	0.167 (± 0.024)	0.029 (± 0.0251)

## Statistical analyses

No statistical analyses for this end point

## Secondary: Change from baseline in standardized FEV1 AUC (0-4 h), FEV1 AUC (4-8h), FEV1 AUC (8-12h) and FEV1 AUC (0-12 h)

End point title	Change from baseline in standardized FEV1 AUC (0-4 h), FEV1 AUC (4-8h), FEV1 AUC (8-12h) and FEV1 AUC (0-12 h)
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End point description:

Pulmonary function assessments were performed using centralized spirometry according to international standards. Baseline FEV1 was defined as the average of the pre-dose FEV1 measured at -45 minutes

(min) and -15 min at day 1. A mixed model for repeated measures (MMRM), used for this analysis, included terms of treatment, baseline FEV1 measurements, smoking status at baseline, baseline inhaled corticosteroid (ICS) use, region, baseline FEV1 \* visit interaction, and visit, treatment \* visit interaction. The trapezoidal rule was used to calculate FEV1 AUC and then normalized to the length of time.

End point type	Secondary
End point timeframe:	
BL, day 1, week 12	

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	258	260	261	261
Units: Liters				
least squares mean (standard error)				
day 1, FEV1 AUC 0-4h (n=249,251,250,246)	0.194 (± 0.0077)	0.096 (± 0.0077)	0.158 (± 0.0077)	0.028 (± 0.0077)
day 1, FEV1 AUC 4-8h (n=257,260,261,257)	0.178 (± 0.0093)	0.096 (± 0.0093)	0.125 (± 0.0093)	0.023 (± 0.0093)
day 1, FEV1 AUC 8-12h (n=254,256,259,253)	0.138 (± 0.0097)	0.065 (± 0.0098)	0.094 (± 0.0097)	-0.006 (± 0.0098)
day 1, FEV1 AUC 0-12h (n=249,251,250,246)	0.171 (± 0.0083)	0.083 (± 0.0083)	0.128 (± 0.0082)	0.016 (± 0.0083)
week 12, FEV1 AUC 0-4h (n=249,251,250,246)	0.254 (± 0.0144)	0.141 (± 0.0144)	0.149 (± 0.0145)	-0.01 (± 0.015)
week 12, FEV1 AUC 4-8h (n=257,260,261,257)	0.205 (± 0.0145)	0.121 (± 0.0144)	0.111 (± 0.0145)	-0.016 (± 0.0151)
week 12, FEV1 AUC 8-12h (n=254,256,259,253)	0.164 (± 0.0145)	0.084 (± 0.0144)	0.072 (± 0.0143)	-0.043 (± 0.0151)
week 12, FEV1 AUC 0-12h (n=249,251,250,246)	0.211 (± 0.014)	0.117 (± 0.014)	0.112 (± 0.0141)	-0.021 (± 0.0145)

## Statistical analyses

No statistical analyses for this end point

## Secondary: Transitional Dyspnea Index (TDI) focal score

End point title	Transitional Dyspnea Index (TDI) focal score
End point description:	
<p>The Baseline Dyspnea Index (BDI) / TDI is an instrument used to assess a participant's level of dyspnea. The BDI and TDI each have three domains: functional impairment, magnitude of task and magnitude of effort. BDI domains were rated from 0 (severe) to 4 (unimpaired) and rates summed for baseline focal score ranged from 0 to 12; lower scores mean worse severity. TDI domains were rated from -3 (major deterioration) to 3 (major improvement) and rates summed for transition focal score ranged from -9 to 9; negative scores indicate deterioration. A TDI focal score of ≥1 was defined as a clinically important improvement from baseline.</p>	
End point type	Secondary
End point timeframe:	
BL, 12 weeks	



End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	246	240	246	226
Units: score on a scale				
least squares mean (standard error)	1.94 ( $\pm$ 0.211)	1.3 ( $\pm$ 0.212)	1.48 ( $\pm$ 0.21)	0.71 ( $\pm$ 0.217)

## Statistical analyses

No statistical analyses for this end point

### Secondary: Change from baseline in mean daily number of puffs of rescue medication

End point title	Change from baseline in mean daily number of puffs of rescue medication
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End point description:

Participants completed an electronic diary (eDiary) twice daily at the same time in the morning and evening to record the number of puffs of rescue medication taken in the previous 12 hours. A negative change from baseline indicates improvement.

End point type	Secondary
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End point timeframe:

BL, 12 Weeks

End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	251	250	252	240
Units: Number of puffs				
least squares mean (standard error)	-2.22 ( $\pm$ 0.135)	-1.72 ( $\pm$ 0.135)	-1.65 ( $\pm$ 0.135)	-1 ( $\pm$ 0.137)

## Statistical analyses

No statistical analyses for this end point

### Secondary: Change from baseline in mean total daily symptom score, mean daytime total symptom score and mean nighttime total symptom score

End point title	Change from baseline in mean total daily symptom score, mean daytime total symptom score and mean nighttime total symptom score
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End point description:

The participant recorded symptom scores twice daily in the eDiary. The daily clinical symptoms included: cough, wheezing, shortness of breath, sputum volume, sputum color, and night time awakening. The range of scores for each assessment is 0 to 3 where 0 indicates No symptom and 3 indicates a Severe symptom. The total daily symptom score is obtained by adding the scores for the morning and evening symptoms for each day. The maximum possible total daily score is 54. A negative change from baseline indicated improvement.

End point type	Secondary
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End point timeframe:

BL, 12 Weeks

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End point values	QVA149	QAB149	NVA237	Placebo
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	258	260	261	261
Units: score on a scale				
least squares mean (standard error)				
Daily (n=251,250,252,240)	-1.3 ( $\pm$ 0.104)	-0.97 ( $\pm$ 0.104)	-0.99 ( $\pm$ 0.104)	-0.52 ( $\pm$ 0.106)
Daytime (n=245,246,245,238)	-1.17 ( $\pm$ 0.102)	-0.85 ( $\pm$ 0.102)	-0.88 ( $\pm$ 0.102)	-0.38 ( $\pm$ 0.103)
Nighttime (n=244,248,248,234)	-1.07 ( $\pm$ 0.106)	-0.83 ( $\pm$ 0.105)	-0.85 ( $\pm$ 0.105)	-0.4 ( $\pm$ 0.107)

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### Statistical analyses

No statistical analyses for this end point

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## Adverse events

### Adverse events information

Timeframe for reporting adverse events:

Adverse events are collected from First Patient First Visit (FPFV) until Last Patient Last Visit (LPLV). All adverse events reported in this record are from date of First Patient First Treatment until Last Patient Last Visit

Adverse event reporting additional description:

Consistent with EudraCT disclosure specifications, Novartis has reported under the Serious adverse events field "number of deaths resulting from adverse events" all those deaths, resulting from serious adverse events that are deemed to be causally related to treatment by the investigator.

Assessment type	Systematic
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### Dictionary used

Dictionary name	MedDRA
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Dictionary version	16.1
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### Reporting groups

Reporting group title	QVA149 27.5/12.5 mcg
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Reporting group description:

QVA149 27.5/12.5 mcg

Reporting group title	QAB149 27.5 mcg
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Reporting group description:

QAB149 27.5 mcg

Reporting group title	NVA237 12.5 mcg
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Reporting group description:

NVA237 12.5 mcg

Reporting group title	Placebo
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Reporting group description:

Placebo

Serious adverse events	QVA149 27.5/12.5 mcg	QAB149 27.5 mcg	NVA237 12.5 mcg
Total subjects affected by serious adverse events			
subjects affected / exposed	10 / 258 (3.88%)	13 / 260 (5.00%)	8 / 262 (3.05%)
number of deaths (all causes)	0	2	1
number of deaths resulting from adverse events	0	0	0
Neoplasms benign, malignant and unspecified (incl cysts and polyps)			
BLADDER TRANSITIONAL CELL CARCINOMA			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
SMALL CELL LUNG CANCER			

subjects affected / exposed	1 / 258 (0.39%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Vascular disorders			
PERIPHERAL ISCHAEMIA			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
General disorders and administration site conditions			
NON-CARDIAC CHEST PAIN			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	1 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Immune system disorders			
ANAPHYLACTIC REACTION			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Respiratory, thoracic and mediastinal disorders			
ACUTE RESPIRATORY FAILURE			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	1 / 262 (0.38%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
ASPIRATION			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
CHRONIC OBSTRUCTIVE PULMONARY DISEASE			
subjects affected / exposed	2 / 258 (0.78%)	5 / 260 (1.92%)	4 / 262 (1.53%)
occurrences causally related to treatment / all	0 / 2	0 / 5	0 / 4
deaths causally related to treatment / all	0 / 0	0 / 1	0 / 0
RESPIRATORY FAILURE			

subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Investigations			
ALANINE AMINOTRANSFERASE INCREASED			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	1 / 262 (0.38%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
ASPARTATE AMINOTRANSFERASE INCREASED			
subjects affected / exposed	1 / 258 (0.39%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
GAMMA-GLUTAMYLTRANSFERASE INCREASED			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	1 / 262 (0.38%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Injury, poisoning and procedural complications			
ALCOHOL POISONING			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Cardiac disorders			
ANGINA PECTORIS			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
ATRIAL FIBRILLATION			
subjects affected / exposed	2 / 258 (0.78%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	2 / 2	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
CARDIAC ARREST			

subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
CARDIO-RESPIRATORY ARREST			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 1	0 / 0
Nervous system disorders			
BRAIN INJURY			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 1	0 / 0
CEREBROVASCULAR ACCIDENT			
subjects affected / exposed	1 / 258 (0.39%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 2	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
CONVULSION			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	1 / 262 (0.38%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
LACUNAR INFARCTION			
subjects affected / exposed	1 / 258 (0.39%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	1 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
MIGRAINE			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Blood and lymphatic system disorders			
NORMOCHROMIC NORMOCYTIC ANAEMIA			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	1 / 262 (0.38%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0

Gastrointestinal disorders			
COLITIS			
subjects affected / exposed	1 / 258 (0.39%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
INTESTINAL OBSTRUCTION			
subjects affected / exposed	1 / 258 (0.39%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 2	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
SMALL INTESTINAL OBSTRUCTION			
subjects affected / exposed	1 / 258 (0.39%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Hepatobiliary disorders			
BILIARY COLIC			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Renal and urinary disorders			
RENAL FAILURE			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	1 / 262 (0.38%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 1
RENAL FAILURE ACUTE			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Infections and infestations			
INFLUENZA			
subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
PNEUMONIA			

subjects affected / exposed	0 / 258 (0.00%)	0 / 260 (0.00%)	2 / 262 (0.76%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 2
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
UPPER RESPIRATORY TRACT INFECTION BACTERIAL			
subjects affected / exposed	1 / 258 (0.39%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
URINARY TRACT INFECTION			
subjects affected / exposed	0 / 258 (0.00%)	1 / 260 (0.38%)	0 / 262 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0

<b>Serious adverse events</b>	Placebo		
Total subjects affected by serious adverse events			
subjects affected / exposed	8 / 260 (3.08%)		
number of deaths (all causes)	1		
number of deaths resulting from adverse events	0		
Neoplasms benign, malignant and unspecified (incl cysts and polyps)			
BLADDER TRANSITIONAL CELL CARCINOMA			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
SMALL CELL LUNG CANCER			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
Vascular disorders			
PERIPHERAL ISCHAEMIA			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
General disorders and administration site conditions			
NON-CARDIAC CHEST PAIN			



subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
Immune system disorders			
ANAPHYLACTIC REACTION			
subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 0		
Respiratory, thoracic and mediastinal disorders			
ACUTE RESPIRATORY FAILURE			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
ASPIRATION			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
CHRONIC OBSTRUCTIVE PULMONARY DISEASE			
subjects affected / exposed	3 / 260 (1.15%)		
occurrences causally related to treatment / all	1 / 4		
deaths causally related to treatment / all	0 / 0		
RESPIRATORY FAILURE			
subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 1		
Investigations			
ALANINE AMINOTRANSFERASE INCREASED			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
ASPARTATE AMINOTRANSFERASE INCREASED			

subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
<b>GAMMA-GLUTAMYLTRANSFERASE INCREASED</b>			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
<b>Injury, poisoning and procedural complications</b>			
<b>ALCOHOL POISONING</b>			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
<b>Cardiac disorders</b>			
<b>ANGINA PECTORIS</b>			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
<b>ATRIAL FIBRILLATION</b>			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
<b>CARDIAC ARREST</b>			
subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 1		
<b>CARDIO-RESPIRATORY ARREST</b>			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
<b>Nervous system disorders</b>			
<b>BRAIN INJURY</b>			

subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 1		
CEREBROVASCULAR ACCIDENT			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
CONVULSION			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
LACUNAR INFARCTION			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
MIGRAINE			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
Blood and lymphatic system disorders			
NORMOCHROMIC NORMOCYTIC ANAEMIA			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
Gastrointestinal disorders			
COLITIS			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
INTESTINAL OBSTRUCTION			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		

SMALL INTESTINAL OBSTRUCTION			
subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	1 / 1		
deaths causally related to treatment / all	0 / 0		
Hepatobiliary disorders			
BILIARY COLIC			
subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 0		
Renal and urinary disorders			
RENAL FAILURE			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
RENAL FAILURE ACUTE			
subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 1		
Infections and infestations			
INFLUENZA			
subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 0		
PNEUMONIA			
subjects affected / exposed	1 / 260 (0.38%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 0		
UPPER RESPIRATORY TRACT INFECTION BACTERIAL			
subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
URINARY TRACT INFECTION			

subjects affected / exposed	0 / 260 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		

Frequency threshold for reporting non-serious adverse events: 5 %

<b>Non-serious adverse events</b>	QVA149 27.5/12.5 mcg	QAB149 27.5 mcg	NVA237 12.5 mcg
Total subjects affected by non-serious adverse events			
subjects affected / exposed	58 / 258 (22.48%)	57 / 260 (21.92%)	64 / 262 (24.43%)
Respiratory, thoracic and mediastinal disorders			
CHRONIC OBSTRUCTIVE PULMONARY DISEASE			
subjects affected / exposed	46 / 258 (17.83%)	52 / 260 (20.00%)	60 / 262 (22.90%)
occurrences (all)	66	66	86
Infections and infestations			
NASOPHARYNGITIS			
subjects affected / exposed	17 / 258 (6.59%)	8 / 260 (3.08%)	5 / 262 (1.91%)
occurrences (all)	20	10	5

<b>Non-serious adverse events</b>	Placebo		
Total subjects affected by non-serious adverse events			
subjects affected / exposed	62 / 260 (23.85%)		
Respiratory, thoracic and mediastinal disorders			
CHRONIC OBSTRUCTIVE PULMONARY DISEASE			
subjects affected / exposed	59 / 260 (22.69%)		
occurrences (all)	96		
Infections and infestations			
NASOPHARYNGITIS			
subjects affected / exposed	6 / 260 (2.31%)		
occurrences (all)	6		

## More information

### Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
31 May 2013	Amendment 1: The purpose of the amendment was to ensure that there was no overlap of patients between this trial and the replicate trial, QVA149A2337, which would protect the integrity of both trials. An exclusion criterion was added to the current trial, which excluded patients who previously enrolled in QVA149A2337. Changes were made to the analyses used to evaluate the primary endpoint as follows: 1) a 2-way interaction between baseline and visit in the model was added in order to account for the difference in correlation between the outcome and baseline at each visit; and 2) the sensitivity analysis based only on the completers at week 12 was removed as the underlying assumption of data being missing completely at random was too restrictive. In addition, patients with moderate renal impairment were allowed to participate in the trial, ensuring that the protocol population was not too restrictive.

Notes:

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### Interruptions (globally)

Were there any global interruptions to the trial? No

### Limitations and caveats

None reported