ClinicalTrials.gov
A service of the U.S. National Institutes of Health

Trial record **1 of 1** for: CZOL446H2409

Previous Study | Return to List | Next Study

Efficacy Study of Zoledronic Acid and Teriparatide Combination Therapy in Women With Osteoporosis

This study has been completed.

Sponsor:
Novartis

Information provided by:
Novartis

ClinicalTrials.gov Identifier:
NCT00439244

First received: February 22, 2007
Last updated: March 23, 2011
Last verified: March 2011
History of Changes

Full Text View | Tabular View | Study Results | Disclaimer | How to Read a Study Record

Results First Received: January 5, 2011

Study Type:	Interventional
Study Design:	Allocation: Randomized; Endpoint Classification: Efficacy Study; Intervention Model: Parallel Assignment; Masking: Double Blind (Subject, Caregiver, Investigator, Outcomes Assessor); Primary Purpose: Treatment
Condition:	Osteoporosis
Interventions:	Drug: Zoledronic acid Drug: Placebo Drug: Teriparatide

Participant Flow

Hide Participant Flow

Recruitment Details

Key information relevant to the recruitment process for the overall study, such as dates of the recruitment period and locations
No text entered.

Pre-Assignment Details

Significant events and approaches for the overall study following participant enrollment, but prior to group assignment
No text entered.

Reporting Groups

	Description
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.

Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Participant Flow: Overall Study

	Zoledronic Acid Plus Teriparatide	Zoledronic Acid	Placebo Zoledronic Acid Plus Teriparatide
STARTED	137 [1]	137	138
Safety Population	137 [2]	137	137
COMPLETED	126	131	131
NOT COMPLETED	11	6	7
Adverse Event	5	2	3
Withdrawal by Subject	3	1	2
Lost to Follow-up	2	1	2
Death	0	1	0
Protocol Violation	0	1	0
Administrative problems	1	0	0

[1] "Started" indicates randomized as well as intent to treat (ITT) population enrolled to study.
[2] Total safety population is 411. One patient was randomized, but never received any study medication.

Baseline Characteristics

Hide Baseline Characteristics

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
No text entered.

Reporting Groups

	Description
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.
Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Total	Total of all reporting groups

Baseline Measures

	Zoledronic Acid Plus Teriparatide	Zoledronic Acid	Placebo Zoledronic Acid Plus Teriparatide	Total
Number of Participants				

[units: participants]	**137**	**137**	**138**	**412**
Age [units: years] Mean (Standard Deviation)	**65.0 (8.78)**	**66.1 (9.02)**	**63.8 (9.08)**	**65.0 (8.99)**
Gender [units: participants]				
Female	**137**	**137**	**138**	**412**
Male	**0**	**0**	**0**	**0**

Outcome Measures

Hide All Outcome Measures

1. Primary: Percent Change From Baseline in Lumbar Spine Bone Mineral Density (BMD) at Week 52 [Time Frame: Baseline through Week 52]

Measure Type	Primary
Measure Title	Percent Change From Baseline in Lumbar Spine Bone Mineral Density (BMD) at Week 52
Measure Description	BMD measurements of the lumbar spine (L1-L4) by Dual X-ray absorptiometry (DXA) were performed on all patients at screening, and Weeks 13, 26, and 52 (or early termination). Every attempt was made to obtain the BMD measurements at the scheduled visit. If this was not possible, a BMD measurement ± 7 days from the scheduled visit was obtained. For the Final DXA at Week 52, the window was 10 - 15 days prior to the final study visit. BMD scans were acquired locally and all results sent to a central reader for evaluation.
Time Frame	Baseline through Week 52
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
The intent-to-treat (ITT) population consisted of all randomized patients with available data.

Reporting Groups

	Description
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.
Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Measured Values

	Zoledronic Acid Plus Teriparatide	**Zoledronic Acid**	**Placebo Zoledronic Acid Plus Teriparatide**
Number of Participants Analyzed [units: participants]	**122**	**128**	**131**

Percent Change From Baseline in Lumbar Spine Bone Mineral Density (BMD) at Week 52 [units: Percent change] Least Squares Mean (Standard Error)	**7.51 (0.414)**	**4.37 (0.401)**	**7.05 (0.398)**

No statistical analysis provided for Percent Change From Baseline in Lumbar Spine Bone Mineral Density (BMD) at Week 52

2. Secondary: Percent Change From Baseline in Lumbar Spine Bone Mineral Density (BMD) at Week 13 and Week 26 [Time Frame: Baseline through Week 13 and Week 26]

Measure Type	Secondary
Measure Title	Percent Change From Baseline in Lumbar Spine Bone Mineral Density (BMD) at Week 13 and Week 26
Measure Description	BMD measurements of the lumbar spine (L1-L4) by Dual X-ray absorptiometry (DXA) were performed on all patients at screening, and Weeks 13, 26, and 52 (or early termination). Every attempt was made to obtain the BMD measurements at the scheduled visit. If this was not possible, a BMD measurement ± 7 days from the scheduled visit was obtained. For the Final DXA at Week 52, the window was 10 - 15 days prior to the final study visit. BMD scans were acquired locally and all results sent to a central reader for evaluation.
Time Frame	Baseline through Week 13 and Week 26
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
The intent-to-treat (ITT) population consisted of all randomized patients with available data. ITT patients with evaluable measurements at both baseline and post-baseline within each efficacy visit window were analyzed.

Reporting Groups

	Description
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.
Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Measured Values

	Zoledronic Acid Plus Teriparatide	**Zoledronic Acid**	**Placebo Zoledronic Acid Plus Teriparatide**
Number of Participants Analyzed [units: participants]	**137**	**137**	**138**
Percent Change From Baseline in Lumbar Spine Bone Mineral Density (BMD) at Week 13 and Week 26 [units: Percent Change] Least Squares Mean (Standard Error)			
		2.97	

At Week 13 (n= 127, 131, 131)	**4.65 (0.302)**	**(0.297)**	**2.88 (0.297)**
At Week 26 (n= 128, 130, 132)	**6.31 (0.337)**	**3.87 (0.333)**	**4.45 (0.330)**

No statistical analysis provided for Percent Change From Baseline in Lumbar Spine Bone Mineral Density (BMD) at Week 13 and Week 26

3. Secondary: Percent Change From Baseline in Total Hip Bone Mineral Density (BMD) at Week 13, Week 26 and Week 52 [Time Frame: Baseline through Week 13, Week 26 and Week 52]

Measure Type	Secondary
Measure Title	Percent Change From Baseline in Total Hip Bone Mineral Density (BMD) at Week 13, Week 26 and Week 52
Measure Description	BMD measurements of the total hip by Dual X-ray absorptiometry (DXA) were performed on all patients at screening, and Weeks 13, 26, and 52 (or early termination). Every attempt was made to obtain the BMD measurements at the scheduled visit. If this was not possible, a BMD measurement ± 7 days from the scheduled visit was obtained. For the final DXA at Week 52, the window was 10 - 15 days prior to the final study visit. BMD scans were acquired locally and all results sent to a central reader for evaluation.
Time Frame	Baseline through Week 13, Week 26 and Week 52
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
The intent-to-treat (ITT) population consisted of all randomized patients with available data. ITT patients with evaluable measurements at both baseline and post-baseline within each efficacy visit window were analyzed.

Reporting Groups

	Description
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.
Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Measured Values

	Zoledronic Acid Plus Teriparatide	**Zoledronic Acid**	**Placebo Zoledronic Acid Plus Teriparatide**
Number of Participants Analyzed [units: participants]	**137**	**137**	**138**
Percent Change From Baseline in Total Hip Bone Mineral Density (BMD) at Week 13, Week 26 and Week 52 [units: Percent Change] Least Squares Mean (Standard Error)			
At Week 13 (n= 127, 133, 133)	**2.54 (0.222)**	**1.53 (0.216)**	**0.75 (0.216)**

At Week 26 (n= 128, 130, 133)	**2.31 (0.265)**	**1.73 (0.262)**	**0.89 (0.259)**
At Week 52 (n= 123, 129, 129)	**2.33 (0.312)**	**2.16 (0.303)**	**1.10 (0.304)**

No statistical analysis provided for Percent Change From Baseline in Total Hip Bone Mineral Density (BMD) at Week 13, Week 26 and Week 52

4. Secondary: Bone Resorption and Formation Biochemical Markers : N-terminal Propeptide of Type I Collagen (P1NP) [Time Frame: At Baseline, Week 4, Week 8, Week 26, Week 39 and Week 52]

Measure Type	Secondary
Measure Title	Bone Resorption and Formation Biochemical Markers : N-terminal Propeptide of Type I Collagen (P1NP)
Measure Description	Specialized tests for markers of bone formation such as n-terminal propeptide of type I collagen (P1NP) were performed at Baseline, and Weeks 4, 8, 26, 39, and 52. The amount of serum P1NP was determined by the central laboratory.
Time Frame	At Baseline, Week 4, Week 8, Week 26, Week 39 and Week 52
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
The intent-to-treat (ITT) population consisted of all randomized patients with available data. n = ITT patients with a measurement at each visit, as determined by the efficacy visit window

Reporting Groups

	Description
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.
Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Measured Values

	Zoledronic Acid Plus Teriparatide	**Zoledronic Acid**	**Placebo Zoledronic Acid Plus Teriparatide**
Number of Participants Analyzed [units: participants]	**137**	**137**	**138**
Bone Resorption and Formation Biochemical Markers : N-terminal Propeptide of Type I Collagen (P1NP) [units: ng/mL] Mean (Standard Deviation)			
At Baseline (n= 126, 129, 121)	**52.72 (24.815)**	**53.64 (29.233)**	**55.69 (28.631)**

At Week 4 (n= 109, 110, 104)	**61.74 (27.269)**	**39.57 (20.532)**	**93.63 (52.418)**
At Week 8 (n= 106, 107, 98)	**39.91 (22.412)**	**21.68 (13.827)**	**99.27 (48.404)**
At Week 26 (n= 116, 119, 114)	**65.26 (68.922)**	**18.32 (15.255)**	**156.97 (109.740)**
At Week 39 (n= 110, 115, 110)	**97.00 (112.804)**	**20.69 (13.326)**	**153.92 (103.065)**
At Week 52 (n= 110, 113, 112)	**112.87 (106.987)**	**23.49 (16.137)**	**137.53 (93.170)**

No statistical analysis provided for Bone Resorption and Formation Biochemical Markers : N-terminal Propeptide of Type I Collagen (P1NP)

5. Secondary: Bone Resorption and Formation Biochemical Markers : Beta C-terminal Telopeptides of Type I Collagen (β-CTx) [Time Frame: At Baseline, Week 4, Week 8, Week 26, Week 39 and Week 52]

Measure Type	Secondary
Measure Title	Bone Resorption and Formation Biochemical Markers : Beta C-terminal Telopeptides of Type I Collagen (β-CTx)
Measure Description	Specialized tests for markers of bone formation such as β-CTx were performed at Baseline, and Weeks 4, 8, 26, 39, and 52. The amount of serum β-CTx was determined by the central laboratory.
Time Frame	At Baseline, Week 4, Week 8, Week 26, Week 39 and Week 52
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
The intent-to-treat (ITT) population consisted of all randomized patients with available data. n = ITT patients with a measurement at each visit, as determined by the efficacy visit window

Reporting Groups

	Description
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.
Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Measured Values

	Zoledronic Acid Plus Teriparatide	**Zoledronic Acid**	**Placebo Zoledronic Acid Plus Teriparatide**
Number of Participants Analyzed [units: participants]	**137**	**137**	**138**
Bone Resorption and Formation Biochemical Markers : Beta C-terminal			

Telopeptides of Type I Collagen (β-CTx) [units: ng/mL] Mean (Standard Deviation)			
At Baseline (n= 126, 129, 121)	0.45 (0.191)	0.44 (0.218)	0.46 (0.222)
At Week 4 (n= 109, 110, 104)	0.05 (0.048)	0.05 (0.059)	0.45 (0.259)
At Week 8 (n= 106, 107, 98)	0.09 (0.109)	0.07 (0.112)	0.60 (0.320)
At Week 26 (n= 116, 119, 114)	0.43 (0.419)	0.12 (0.117)	0.90 (0.537)
At Week 39 (n= 110, 115, 110)	0.57 (0.525)	0.15 (0.108)	0.89 (0.503)
At Week 52 (n= 110, 113, 112)	0.64 (0.476)	0.17 (0.122)	0.83 (0.393)

No statistical analysis provided for Bone Resorption and Formation Biochemical Markers : Beta C-terminal Telopeptides of Type I Collagen (β-CTx)

Serious Adverse Events

Hide Serious Adverse Events

Time Frame	52 weeks
Additional Description	The safety population includes 411 patients, one less than the randomized population due to one patient who was randomized and never received any study medication.

Reporting Groups

	Description
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.
Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Serious Adverse Events

	Zoledronic Acid	Zoledronic Acid Plus Teriparatide	Placebo Zoledronic Acid Plus Teriparatide
Total, serious adverse events			
# participants affected / at risk	20/137 (14.60%)	13/137 (9.49%)	15/137 (10.95%)
Cardiac disorders			
Acute myocardial infarction † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Angina pectoris † [1]			

# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	1/137 (0.73%)
Bradycardia † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Cardiac failure † [1]			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Coronary artery disease † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Myocardial infarction † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Pericarditis † [1]			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Right ventricular failure † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Ear and labyrinth disorders			
Meniere's disease † [1]			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Eye disorders			
Glaucoma † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Gastrointestinal disorders			
Colonic polyp † [1]			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Gastric ulcer † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Gastric ulcer haemorrhage † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Vomiting † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
General disorders			
Face oedema † [1]			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Fatigue † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Implant site irritation † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Non-cardiac chest pain † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Oedema peripheral † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	1/137 (0.73%)
Surgical failure † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Systemic inflammatory response syndrome † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Hepatobiliary disorders			

Cholelithiasis † 1			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Infections and infestations			
Cellulitis † 1			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Lobar pneumonia † 1			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Pneumonia † 1			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	1/137 (0.73%)
Pyelonephritis † 1			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Respiratory tract infection † 1			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Urinary tract infection † 1			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	1/137 (0.73%)
Injury, poisoning and procedural complications			
Ankle fracture † 1			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Fall † 1			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Humerus fracture † 1			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Lumbar vertebral fracture † 1			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Meniscus lesion † 1			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Rib fracture † 1			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Thoracic vertebral fracture † 1			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Metabolism and nutrition disorders			
Diabetes mellitus † 1			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Hypoglycaemia † 1			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Hypokalaemia † 1			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	1/137 (0.73%)
Hypomagnesaemia † 1			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Musculoskeletal and connective tissue disorders			
Arthralgia † 1			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Intervertebral disc protrusion † 1			

# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Osteoarthritis † [1]			
# participants affected / at risk	2/137 (1.46%)	0/137 (0.00%)	0/137 (0.00%)
Rotator cuff syndrome † [1]			
# participants affected / at risk	1/137 (0.73%)	1/137 (0.73%)	0/137 (0.00%)
Neoplasms benign, malignant and unspecified (incl cysts and polyps)			
Basal cell carcinoma † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Colon cancer † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Gastric cancer † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Metastases to liver † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Pancreatic carcinoma † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Nervous system disorders			
Cerebrovascular accident † [1]			
# participants affected / at risk	0/137 (0.00%)	2/137 (1.46%)	0/137 (0.00%)
Epilepsy † [1]			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Hemiparesis † [1]			
# participants affected / at risk	0/137 (0.00%)	1/137 (0.73%)	0/137 (0.00%)
Presyncope † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	1/137 (0.73%)
Syncope † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Renal and urinary disorders			
Renal failure acute † [1]			
# participants affected / at risk	0/137 (0.00%)	0/137 (0.00%)	1/137 (0.73%)
Stress urinary incontinence † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Reproductive system and breast disorders			
Cystocele † [1]			
# participants affected / at risk	2/137 (1.46%)	0/137 (0.00%)	0/137 (0.00%)
Rectocele † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Vaginal prolapse † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Respiratory, thoracic and mediastinal disorders			
Acute respiratory failure † [1]			
# participants affected / at risk	1/137 (0.73%)	0/137 (0.00%)	0/137 (0.00%)
Diaphragmatic hernia † [1]			

# participants affected / at risk	**0/137 (0.00%)**	**0/137 (0.00%)**	**1/137 (0.73%)**
Dyspnoea † 1			
# participants affected / at risk	**0/137 (0.00%)**	**0/137 (0.00%)**	**1/137 (0.73%)**
Epiglottic cyst † 1			
# participants affected / at risk	**0/137 (0.00%)**	**1/137 (0.73%)**	**0/137 (0.00%)**
Epistaxis † 1			
# participants affected / at risk	**0/137 (0.00%)**	**1/137 (0.73%)**	**0/137 (0.00%)**
Respiratory failure † 1			
# participants affected / at risk	**1/137 (0.73%)**	**0/137 (0.00%)**	**0/137 (0.00%)**
Skin and subcutaneous tissue disorders			
Decubitus ulcer † 1			
# participants affected / at risk	**1/137 (0.73%)**	**0/137 (0.00%)**	**0/137 (0.00%)**
Social circumstances			
Social problem † 1			
# participants affected / at risk	**0/137 (0.00%)**	**1/137 (0.73%)**	**0/137 (0.00%)**
Vascular disorders			
Arterial haemorrhage † 1			
# participants affected / at risk	**0/137 (0.00%)**	**0/137 (0.00%)**	**1/137 (0.73%)**
Arterial occlusive disease † 1			
# participants affected / at risk	**0/137 (0.00%)**	**0/137 (0.00%)**	**1/137 (0.73%)**
Haematoma † 1			
# participants affected / at risk	**0/137 (0.00%)**	**2/137 (1.46%)**	**0/137 (0.00%)**
Hypertension † 1			
# participants affected / at risk	**1/137 (0.73%)**	**0/137 (0.00%)**	**0/137 (0.00%)**

† Events were collected by systematic assessment
1 Term from vocabulary, MedDRA 10.X

Other Adverse Events

Hide Other Adverse Events

Time Frame	52 weeks
Additional Description	The safety population includes 411 patients, one less than the randomized population due to one patient who was randomized and never received any study medication.

Frequency Threshold

Threshold above which other adverse events are reported	5%

Reporting Groups

	Description
Zoledronic Acid	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion.
Zoledronic Acid Plus Teriparatide	Zoledronic acid 5.0 mg/100 mL was administered via a peripheral intravenous site at Visit 2 (once at randomization) as a slow 15-minute infusion. Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Placebo Zoledronic Acid Plus Teriparatide	Placebo zoledronic acid 100 mL intravenous (i.v.) (once at randomization) plus teriparatide 20 µg (daily subcutaneous injections administered concurrently through 52 weeks). Teriparatide is supplied as sterile, colorless clear, isotonic solution in a glass cartridge which is pre-assembled into a disposable pen device for subcutaneous injection. The pen device delivers 20 µg of teriparatide concurrently as daily subcutaneous injections for 52 weeks.

Other Adverse Events

	Zoledronic Acid	Zoledronic Acid Plus Teriparatide	Placebo Zoledronic Acid Plus Teriparatide
Total, other (not including serious) adverse events			
# participants affected / at risk	**115/137 (83.94%)**	**118/137 (86.13%)**	**96/137 (70.07%)**
Ear and labyrinth disorders			
Vertigo † [1]			
# participants affected / at risk	**7/137 (5.11%)**	**5/137 (3.65%)**	**9/137 (6.57%)**
Gastrointestinal disorders			
Constipation † [1]			
# participants affected / at risk	**8/137 (5.84%)**	**10/137 (7.30%)**	**9/137 (6.57%)**
Diarrhoea † [1]			
# participants affected / at risk	**6/137 (4.38%)**	**5/137 (3.65%)**	**11/137 (8.03%)**
Dyspepsia † [1]			
# participants affected / at risk	**4/137 (2.92%)**	**4/137 (2.92%)**	**8/137 (5.84%)**
Nausea † [1]			
# participants affected / at risk	**15/137 (10.95%)**	**21/137 (15.33%)**	**19/137 (13.87%)**
Vomiting † [1]			
# participants affected / at risk	**9/137 (6.57%)**	**10/137 (7.30%)**	**4/137 (2.92%)**
General disorders			
Chills † [1]			
# participants affected / at risk	**13/137 (9.49%)**	**16/137 (11.68%)**	**4/137 (2.92%)**
Fatigue † [1]			
# participants affected / at risk	**17/137 (12.41%)**	**19/137 (13.87%)**	**13/137 (9.49%)**
Influenza like illness † [1]			
# participants affected / at risk	**13/137 (9.49%)**	**20/137 (14.60%)**	**6/137 (4.38%)**
Oedema peripheral † [1]			
# participants affected / at risk	**11/137 (8.03%)**	**7/137 (5.11%)**	**6/137 (4.38%)**
Pyrexia † [1]			
# participants affected / at risk	**8/137 (5.84%)**	**17/137 (12.41%)**	**3/137 (2.19%)**
Infections and infestations			
Bronchitis † [1]			
# participants affected / at risk	**17/137 (12.41%)**	**5/137 (3.65%)**	**6/137 (4.38%)**
Influenza † [1]			
# participants affected / at risk	**7/137 (5.11%)**	**9/137 (6.57%)**	**4/137 (2.92%)**
Nasopharyngitis † [1]			
# participants affected / at risk	**16/137 (11.68%)**	**23/137 (16.79%)**	**20/137 (14.60%)**
Sinusitis † [1]			

# participants affected / at risk	**5/137 (3.65%)**	**7/137 (5.11%)**	**1/137 (0.73%)**
Upper respiratory tract infection † 1			
# participants affected / at risk	**7/137 (5.11%)**	**5/137 (3.65%)**	**7/137 (5.11%)**
Urinary tract infection † 1			
# participants affected / at risk	**13/137 (9.49%)**	**7/137 (5.11%)**	**9/137 (6.57%)**
Injury, poisoning and procedural complications			
Contusion † 1			
# participants affected / at risk	**6/137 (4.38%)**	**7/137 (5.11%)**	**9/137 (6.57%)**
Fall † 1			
# participants affected / at risk	**9/137 (6.57%)**	**7/137 (5.11%)**	**4/137 (2.92%)**
Musculoskeletal and connective tissue disorders			
Arthralgia † 1			
# participants affected / at risk	**30/137 (21.90%)**	**31/137 (22.63%)**	**18/137 (13.14%)**
Back pain † 1			
# participants affected / at risk	**23/137 (16.79%)**	**23/137 (16.79%)**	**16/137 (11.68%)**
Bone pain † 1			
# participants affected / at risk	**6/137 (4.38%)**	**8/137 (5.84%)**	**4/137 (2.92%)**
Muscle spasms † 1			
# participants affected / at risk	**4/137 (2.92%)**	**5/137 (3.65%)**	**9/137 (6.57%)**
Musculoskeletal pain † 1			
# participants affected / at risk	**7/137 (5.11%)**	**7/137 (5.11%)**	**8/137 (5.84%)**
Myalgia † 1			
# participants affected / at risk	**22/137 (16.06%)**	**15/137 (10.95%)**	**6/137 (4.38%)**
Osteoarthritis † 1			
# participants affected / at risk	**2/137 (1.46%)**	**8/137 (5.84%)**	**6/137 (4.38%)**
Pain in extremity † 1			
# participants affected / at risk	**15/137 (10.95%)**	**17/137 (12.41%)**	**8/137 (5.84%)**
Nervous system disorders			
Dizziness † 1			
# participants affected / at risk	**3/137 (2.19%)**	**5/137 (3.65%)**	**7/137 (5.11%)**
Headache † 1			
# participants affected / at risk	**24/137 (17.52%)**	**24/137 (17.52%)**	**20/137 (14.60%)**
Vascular disorders			
Hypertension † 1			
# participants affected / at risk	**6/137 (4.38%)**	**8/137 (5.84%)**	**9/137 (6.57%)**

† Events were collected by systematic assessment
1 Term from vocabulary, MedDRA 10.X

Limitations and Caveats

Hide Limitations and Caveats

Limitations of the study, such as early termination leading to small numbers of participants analyzed and technical problems with measurement

leading to unreliable or uninterpretable data
No teriparatide placebo available, Short study duration, Only bone mineral data, No bone strength or bone stucture assessment, No bone turnover markers data between 8 and 26 weeks, Study not powered for fracture outcomes.

More Information

Hide More Information

Certain Agreements:

Principal Investigators are **NOT** employed by the organization sponsoring the study.
There **IS** an agreement between Principal Investigators and the Sponsor (or its agents) that restricts the PI's rights to discuss or publish trial results after the trial is completed.
The agreement is: ☐ The only disclosure restriction on the PI is that the sponsor can review results communications prior to public release and can embargo communications regarding trial results for a period that is **less than or equal to 60 days**. The sponsor cannot require changes to the communication and cannot extend the embargo. ☐ The only disclosure restriction on the PI is that the sponsor can review results communications prior to public release and can embargo communications regarding trial results for a period that is **more than 60 days but less than or equal to 180 days**. The sponsor cannot require changes to the communication and cannot extend the embargo. Other disclosure agreement that restricts the right of the PI to discuss or publish trial results after the trial is completed. ☑ **Restriction Description:** The terms and conditions of Novartis' agreements with its investigators may vary. However, Novartis does not prohibit any investigator from publishing. Any publications from a single-site are postponed until the publication of the pooled data (i.e., data from all sites) in the clinical trial.

Results Point of Contact:

Name/Title: Study Director
Organization: Novartis Pharmaceuticals
phone: 862-778-8300

No publications provided

Responsible Party:	External Affairs, Novartis
ClinicalTrials.gov Identifier:	NCT00439244 History of Changes
Other Study ID Numbers:	**CZOL446H2409**
Study First Received:	February 22, 2007
Results First Received:	January 5, 2011
Last Updated:	March 23, 2011
Health Authority:	Argentina: National Administration of Drugs, Foods and Medical Technology Belgium: Federal Agency for Medicines and Health Products, FAMHP Germany: Federal Institute for Drugs and Medical Devices Spain: Spanish Agency of Medicines United States: Food and Drug Administration