

# CINACALCET HYDROCHLORIDE- cinacalcet tablet

## Amneal Pharmaceuticals LLC

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### HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use CINACALCET TABLETS safely and effectively. See full prescribing information for CINACALCET TABLETS.

**CINACALCET tablets, for oral use**  
**Initial U.S. Approval: 2004**

### INDICATIONS AND USAGE

Cinacalcet tablets are a positive modulator of the calcium sensing receptor indicated for:

- Secondary Hyperparathyroidism (HPT) in adult patients with chronic kidney disease (CKD) on dialysis. (1.1)  
Limitations of Use: Cinacalcet tablets are not indicated for use in patients with CKD who are not on dialysis.
- Hypercalcemia in adult patients with Parathyroid Carcinoma (PC). (1.2)
- Hypercalcemia in adult patients with primary HPT for whom parathyroidectomy would be indicated on the basis of serum calcium levels, but who are unable to undergo parathyroidectomy. (1.3)

### DOSAGE AND ADMINISTRATION

- Cinacalcet tablets should be taken with food or shortly after a meal. (2.1)
- Tablets should always be taken whole and not divided. (2.1)
- Secondary HPT in patients with CKD on dialysis (2.2):
  - Starting dose is 30 mg once daily.
  - Titrate dose no more frequently than every 2 to 4 weeks through sequential doses of 30 mg, 60 mg, 90 mg, 120 mg, and 180 mg once daily as necessary to achieve targeted intact parathyroid hormone (iPTH) levels.
  - iPTH levels should be measured no earlier than 12 hours after most recent dose.
- Hypercalcemia in patients with PC or hypercalcemia in patients with primary HPT (2.3):
  - Starting dose is 30 mg twice daily.
  - Titrate dose every 2 to 4 weeks through sequential doses of 30 mg twice daily, 60 mg twice daily, 90 mg twice daily, and 90 mg three or four times daily as necessary to normalize serum calcium levels.
- Once the maintenance dose has been established, monitor serum calcium approximately monthly for patients with secondary HPT and every 2 months for patients with PC or primary HPT. (2.5)

### DOSAGE FORMS AND STRENGTHS

Tablets: 30 mg, 60 mg, and 90 mg tablets (3)

### CONTRAINDICATIONS

Cinacalcet hydrochloride treatment initiation is contraindicated if serum calcium is less than the lower limit of the normal range. (4, 5.1)

### WARNINGS AND PRECAUTIONS

- *Hypocalcemia:* Life threatening events and fatal outcomes were reported. Hypocalcemia can prolong QT interval, lower the threshold for seizures, and cause hypotension, worsening heart failure, and/or arrhythmia. Monitor serum calcium carefully for the occurrence of hypocalcemia during treatment. (2.5, 5.1)
- *Upper Gastrointestinal (GI) Bleeding:* Patients with risk factors for upper GI bleeding may be at increased risk. Monitor patients and promptly evaluate and treat any suspected GI bleeding. (5.2)
- *Hypotension, Worsening Heart Failure and/or Arrhythmias:* In postmarketing safety surveillance, isolated, idiosyncratic cases of hypotension, worsening heart failure, and/or arrhythmia have been reported in patients with impaired cardiac function. (5.3)
- *Adynamic Bone Disease:* May develop if iPTH levels are suppressed below 100 pg/mL. (5.4)

### ADVERSE REACTIONS

The most common adverse reactions (i.e.,  $\geq 25\%$ ) associated with cinacalcet hydrochloride were nausea and vomiting. (6)

To report **SUSPECTED ADVERSE REACTIONS**, contact Amneal Pharmaceuticals at 1-877-835-5472 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).

-----**DRUG INTERACTIONS**-----

- Co-administration with a strong CYP3A4 inhibitor may increase serum levels of cinacalcet. Dose adjustment and monitoring of iPTH serum phosphorous and serum calcium may be required. (7.1)
- Cinacalcet is a strong inhibitor of CYP2D6. Dose adjustments may be required for concomitant medications that are predominantly metabolized by CYP2D6. (7.2)

-----**USE IN SPECIFIC POPULATIONS**-----

- Pediatric Use: A fatal outcome was reported in a pediatric clinical trial patient with severe hypocalcemia. Cinacalcet hydrochloride is not indicated for use in pediatric patients. (8.4).

See 17 for **PATIENT COUNSELING INFORMATION**.

Revised: 8/2021

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## **FULL PRESCRIBING INFORMATION**

### **1 INDICATIONS AND USAGE**

#### **1.1 Secondary Hyperparathyroidism**

Cinacalcet tablets are indicated for the treatment of secondary hyperparathyroidism (HPT) in adult patients with chronic kidney disease (CKD) on dialysis [see *Clinical Studies (14.1)*].

#### Limitations of Use:

Cinacalcet tablets are not indicated for use in patients with CKD who are not on dialysis because of an increased risk of hypocalcemia [see *Warnings and Precautions (5.1)*].

#### **1.2 Parathyroid Carcinoma**

Cinacalcet tablets are indicated for the treatment of hypercalcemia in adult patients with Parathyroid Carcinoma [see *Clinical Studies (14.2)*].

#### **1.3 Primary Hyperparathyroidism**

Cinacalcet tablets are indicated for the treatment of hypercalcemia in adult patients with primary HPT for whom parathyroidectomy would be indicated on the basis of serum calcium levels, but who are unable to undergo parathyroidectomy [see *Clinical Studies (14.3)*].

### **2 DOSAGE AND ADMINISTRATION**

#### **2.1 Administration**

Cinacalcet tablets should be taken with food or shortly after a meal.

Cinacalcet tablets are administered orally and should always be taken whole and not chewed, crushed, or divided.

## **2.2 Secondary Hyperparathyroidism in Patients with Chronic Kidney Disease on Dialysis**

The recommended starting oral dose of cinacalcet tablets is 30 mg once daily. Serum calcium and serum phosphorus should be measured within 1 week and intact parathyroid hormone (iPTH) should be measured 1 to 4 weeks after initiation or dose adjustment of cinacalcet tablets [see *Dosage and Administration (2.3)*]. Cinacalcet tablets should be titrated no more frequently than every 2 to 4 weeks through sequential doses of 30 mg, 60 mg, 90 mg, 120 mg, and 180 mg once daily to target iPTH levels of 150 to 300 pg/mL. Serum iPTH levels should be assessed no earlier than 12 hours after dosing with cinacalcet tablets.

Cinacalcet tablets can be used alone or in combination with vitamin D sterols and/or phosphate binders.

During dose titration, serum calcium levels should be monitored frequently and if levels decrease below the normal range, appropriate steps should be taken to increase serum calcium levels, such as by providing supplemental calcium, initiating or increasing the dose of calcium-based phosphate binder, initiating or increasing the dose of vitamin D sterols, or temporarily withholding treatment with cinacalcet tablets [see *Dosage and Administration (2.3)* and *Warnings and Precautions (5.1)*].

## **2.3 Patients with Parathyroid Carcinoma and Primary Hyperparathyroidism**

The recommended starting oral dose of cinacalcet tablets is 30 mg twice daily.

The dose of cinacalcet tablets should be titrated every 2 to 4 weeks through sequential doses of 30 mg twice daily, 60 mg twice daily, and 90 mg twice daily, and 90 mg 3 or 4 times daily as necessary to normalize serum calcium levels. Serum calcium should be measured within 1 week after initiation or dose adjustment of cinacalcet tablets [see *Dosage and Administration (2.5)* and *Warnings and Precautions (5.1)*].

## **2.4 Switching from Parsabiv (etelcalcetide) to Cinacalcet Tablets**

Discontinue etelcalcetide for at least 4 weeks prior to starting cinacalcet tablets. Ensure corrected serum calcium is at or above the lower limit of normal prior to cinacalcet tablets initiation [see *Warnings and Precautions (5.1)*]. Initiate cinacalcet tablets treatment at a starting dose of 30 mg once daily.

## **2.5 Monitoring for Hypocalcemia**

Once the maintenance dose has been established, serum calcium should be measured approximately monthly for patients with secondary hyperparathyroidism with CKD on dialysis, and every 2 months for patients with parathyroid carcinoma or primary hyperparathyroidism [see *Dosage and Administration (2.2, 2.3)*].

For secondary hyperparathyroidism patients with CKD on dialysis, if serum calcium falls below 8.4 mg/dL but remains above 7.5 mg/dL, or if symptoms of hypocalcemia occur, calcium-containing phosphate binders and/or vitamin D sterols can be used to raise serum calcium. If serum calcium falls below 7.5 mg/dL, or if symptoms of hypocalcemia persist and the dose of vitamin D cannot be increased, withhold administration of

cinacalcet tablets until serum calcium levels reach 8 mg/dL and/or symptoms of hypocalcemia have resolved. Treatment should be reinitiated using the next lowest dose of cinacalcet tablets [see *Dosage and Administration (2.2)*].

### **3 DOSAGE FORMS AND STRENGTHS**

- 30 mg tablets (green color, coated, oval-shaped tablets, debossed with “155” on one side and plain on the other side)
- 60 mg tablets (green color, coated, oval-shaped tablets, debossed with “157” on one side and plain on the other side)
- 90 mg tablets (green color, coated, oval-shaped tablets, debossed with “213” on one side and plain on the other side)

### **4 CONTRAINDICATIONS**

Cinacalcet HCl treatment initiation is contraindicated if serum calcium is less than the lower limit of the normal range [see *Warnings and Precautions (5.1)*].

### **5 WARNINGS AND PRECAUTIONS**

#### **5.1 Hypocalcemia**

Cinacalcet HCl lowers serum calcium and can lead to hypocalcemia [see *Adverse Reactions (6.1)*]. Significant lowering of serum calcium can cause paresthesias, myalgias, muscle spasms, tetany, seizures, QT interval prolongation and ventricular arrhythmia. Life threatening events and fatal outcomes associated with hypocalcemia have been reported in patients treated with cinacalcet HCl, including in pediatric patients. The safety and effectiveness of cinacalcet HCl have not been established in pediatric patients [see *Pediatric Use (8.4)*].

Cinacalcet HCl is not indicated for patients with CKD not on dialysis [see *Indications and Usage (1)*]. In patients with secondary HPT and CKD not on dialysis, the long-term safety and efficacy of cinacalcet HCl have not been established. Clinical studies indicate that cinacalcet HCl-treated patients with CKD not on dialysis have an increased risk for hypocalcemia compared with cinacalcet HCl-treated patients with CKD on dialysis, which may be due to lower baseline calcium levels. In a phase 3 study of 32 weeks duration and including 404 patients with CKD not on dialysis (302 cinacalcet, 102 placebo), in which the median dose for cinacalcet was 60 mg per day at the completion of the study, 80% of cinacalcet HCl-treated patients experienced at least one serum calcium value < 8.4 mg/dL compared with 5% of patients receiving placebo.

#### QT Interval Prolongation and Ventricular Arrhythmia

Decreases in serum calcium can also prolong the QT interval, potentially resulting in ventricular arrhythmia. Cases of QT prolongation and ventricular arrhythmia have been reported in patients treated with cinacalcet HCl. Patients with congenital long QT syndrome, history of QT interval prolongation, family history of long QT syndrome or sudden cardiac death, and other conditions that predispose to QT interval prolongation and ventricular arrhythmia may be at increased risk for QT interval prolongation and ventricular arrhythmias if they develop hypocalcemia due to cinacalcet HCl. Closely monitor corrected serum calcium and QT interval in patients at risk receiving cinacalcet

HCl.

### Seizures

In clinical studies, seizures (primarily generalized or tonic-clonic) were observed in 1.4% (43/3049) of cinacalcet HCl-treated patients and 0.7% (5/687) of placebo-treated patients. While the basis for the reported difference in seizure rate is not clear, the threshold for seizures is lowered by significant reductions in serum calcium levels. Monitor serum calcium levels in patients with seizure disorders receiving cinacalcet HCl.

### Concurrent Administration with Other Calcium-Lowering Drug Products

Concurrent administration of cinacalcet HCl with calcium-lowering drugs including other calcium-sensing receptor agonists could result in severe hypocalcemia. Closely monitor serum calcium in patients receiving cinacalcet HCl and concomitant therapies known to lower serum calcium levels.

### Patient Education and Hypocalcemia Treatment

Educate patients on the symptoms of hypocalcemia and advise them to contact a healthcare provider if they occur. If corrected serum calcium falls below the lower limit of normal or symptoms of hypocalcemia develop, start or increase calcium supplementation (including calcium, calcium-containing phosphate binders, and/or vitamin D sterols or increases in dialysate calcium concentration). Cinacalcet HCl dose reduction or discontinuation of cinacalcet HCl may be necessary [see *Dosage and Administration (2.2)*].

## **5.2 Upper Gastrointestinal Bleeding**

Cases of gastrointestinal bleeding, mostly upper gastrointestinal bleeding, have occurred in patients using calcimimetics, including cinacalcet HCl, from postmarketing and clinical trial sources. The exact cause of GI bleeding in these patients is unknown.

Patients with risk factors for upper GI bleeding (such as known gastritis, esophagitis, ulcers or severe vomiting) may be at increased risk for GI bleeding when receiving cinacalcet HCl treatment. Monitor patients for worsening of common GI adverse reactions of nausea and vomiting associated with cinacalcet HCl [see *Adverse Reactions (6.1)*] and for signs and symptoms of GI bleeding and ulcerations during cinacalcet HCl therapy. Promptly evaluate and treat any suspected GI bleeding.

## **5.3 Hypotension, Worsening Heart Failure and/or Arrhythmias**

In postmarketing safety surveillance, isolated, idiosyncratic cases of hypotension, worsening heart failure, and/or arrhythmia have been reported in patients with impaired cardiac function, in which a causal relationship to cinacalcet HCl could not be completely excluded and which may be mediated by reductions in serum calcium levels [see *Adverse Reactions (6.2)*].

## **5.4 Adynamic Bone Disease**

Adynamic bone disease may develop if iPTH levels are suppressed below 100 pg/mL. One clinical study evaluated bone histomorphometry in patients treated with cinacalcet HCl for 1 year. Three patients with mild hyperparathyroid bone disease at the beginning of the study developed adynamic bone disease during treatment with cinacalcet HCl. Two of these patients had iPTH levels below 100 pg/mL at multiple time points during the

study. In three 6-month, phase 3 studies conducted in patients with CKD on dialysis, 11% of patients treated with cinacalcet HCl had mean iPTH values below 100 pg/mL during the efficacy-assessment phase. If iPTH levels decrease below 150 pg/mL in patients treated with cinacalcet HCl, the dose of cinacalcet HCl and/or vitamin D sterols should be reduced or therapy discontinued.

## 6 ADVERSE REACTIONS

The following adverse reactions are discussed in greater detail in other sections of labeling:

- Hypocalcemia [*see Warnings and Precautions (5.1)*]
- Upper Gastrointestinal Bleeding [*see Warnings and Precautions (5.2)*]
- Hypotension, Worsening Heart Failure and/or Arrhythmias [*see Warnings and Precautions (5.3)*]
- Adynamic Bone Disease [*see Warnings and Precautions (5.4)*]

### 6.1 Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared with rates in the clinical trials of another drug and may not reflect the rates observed in clinical practice.

#### **Secondary Hyperparathyroidism in Patients with Chronic Kidney Disease on Dialysis**

In three double-blind, placebo-controlled clinical trials, 1126 patients with CKD on dialysis received study drug (656 cinacalcet HCl, 470 placebo) for up to 6 months. The most frequently reported adverse reactions are listed in Table 1.

Seizures were observed in 1.4% (13/910) of cinacalcet HCl-treated patients and 0.7% (5/641) of placebo-treated patients across all completed placebo-controlled trials.

**Table 1. Adverse Reactions with Frequency  $\geq$  5% in Patients on Dialysis in Short-Term Studies for up to 6 Months**

	<b>Placebo</b> (n = 470)	<b>Cinacalcet HCl</b> (n = 656)
Event*:	(%)	(%)
Nausea	19	31
Vomiting	15	27
Diarrhea	20	21
Myalgia	14	15
Dizziness	8	10
Hypertension	5	7
Asthenia	4	7
Anorexia	4	6
Pain Chest, Non-Cardiac	4	6

Dialysis Access Site Infection	4	5
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\*Included are events that were reported at a greater incidence in the cinacalcet HCl group than in the placebo group.

In a randomized, double-blind placebo-controlled study of 3,883 patients with secondary HPT and CKD

receiving dialysis in which patients were treated for up to 64 months (mean duration of treatment was 21

months in the cinacalcet HCl group), the most frequently reported adverse reactions (incidence of  $\geq 5\%$  in the Cinacalcet HCl group and a difference  $\geq 1\%$  compared to placebo) are listed in Table 2.

**Table 2. Frequency of Adverse Reactions in Dialysis Patients Treated for up to 64 Months in a Long-Term Study<sup>1</sup>**

	<b>Placebo</b> (N=1923)	<b>Cinacalcet HCl</b> (N=1938)
	3,699 subject-years	4,044 subject-years
Percent of subjects reporting Adverse Reactions (%)	90.9	93.2
Nausea	15.5	29.1
Vomiting	13.7	25.6
Diarrhea	18.7	20.5
Dyspnea	11.5	13.4
Cough	9.8	11.7
Hypotension	10.5	11.6
Headache	9.6	11.5
Hypocalcaemia	1.4	11.2
Muscle spasms	9.2	11.1
Abdominal pain	9.6	10.9
Abdominal pain upper	6.3	8.2
Hyperkalemia	6.1	8.1
Upper respiratory tract infection	6.3	7.6
Dyspepsia	4.6	7.4
Dizziness	4.7	7.3
Decreased appetite	3.5	5.9
Asthenia	3.8	5.4
Constipation	3.8	5

<sup>1</sup> Adverse reactions that occurred in  $\geq 5\%$  Frequency in the cinacalcet HCl group and a difference  $\geq 1\%$  compared to the placebo group (Safety Analysis Set).

Crude incidence rate =  $100 * \text{Total number of subjects with event} / N$

N=Number of subjects receiving at least one dose of study drug.

Additional adverse reaction rates from the long-term, randomized, double-blind placebo-controlled study for cinacalcet HCl versus placebo are as follows: seizure (2.5%, 1.6%), rash (2.2%, 1.9%), hypersensitivity reactions (9.4%, 8.3%).

### ***Patients with Parathyroid Carcinoma and Primary Hyperparathyroidism***

The safety profile of cinacalcet HCl in these patient populations is generally consistent with that seen in patients with CKD on dialysis. Forty six patients were treated with cinacalcet HCl in a single-arm study, 29 with Parathyroid Carcinoma and 17 with intractable pHPT. Nine (20%) of the patients withdrew from the study due to adverse events. The most frequent adverse reactions and the most frequent cause of withdrawal in these patient populations were nausea and vomiting. Severe or prolonged cases of nausea and vomiting can lead to dehydration and worsening hypercalcemia so careful monitoring of electrolytes is recommended in patients with these symptoms.

Eight patients died during treatment with cinacalcet HCl in this study, 7 with Parathyroid Carcinoma (24%) and 1 (6%) with intractable pHPT. Causes of death were cardiovascular (5 patients), multi-organ failure (1 patient), gastrointestinal hemorrhage (1 patient) and metastatic carcinoma (1 patient). Adverse events of hypocalcemia were reported in three patients (7%).

Seizures were observed in 0.7% (1/140) of cinacalcet-treated patients and 0% (0/46) of placebo-treated patients in all clinical studies.

**Table 3. Adverse Reactions with Frequency  $\geq$ 10% in a Single-Arm, Open-Label Study in Patients with Primary Hyperparathyroidism or Parathyroid Carcinoma**

	Cinacalcet HCl		
	<b>Parathyroid Carcinoma</b> (N=29) n (%)	<b>Intractable pHPT</b> (N=17) n (%)	<b>Total</b> (N=46) n (%)
Number of Subjects Reporting Adverse Reactions	28 (97)	17 (100)	45 (98)
Nausea	19 (66)	10 (59)	29 (63)
Vomiting	15 (52)	6 (35)	21 (46)
Paresthesia	4 (14)	5 (29)	9 (20)
Fatigue	6 (21)	2 (12)	8 (17)
Fracture	6 (21)	2 (12)	8 (17)
Hypercalcemia	6 (21)	2 (12)	8 (17)
Anorexia	6 (21)	1 (6)	7 (15)
Asthenia	5 (17)	2 (12)	7 (15)
Dehydration	7 (24)	0 (0)	7 (15)
Anemia	5 (17)	1 (6)	6 (13)
Arthralgia	5 (17)	1 (6)	6 (13)
Constipation	3 (10)	3 (18)	6 (13)
Depression	3 (10)	3 (18)	6 (13)
Headache	6 (21)	0 (0)	6 (13)

Infection Upper Respiratory	3 (10)	2 (12)	5 (11)
Pain Limb	3 (10)	2 (12)	5 (11)

N=Number of subjects receiving at least one dose of study drug.

pHPT=primary hyperparathyroidism.

In a randomized double-blind, placebo-controlled study of 67 patients with primary hyperparathyroidism for whom parathyroidectomy would be indicated on the basis of serum calcium levels, but who are unable to undergo surgery, the most common adverse reactions are listed in Table 4.

**Table 4. Adverse Reactions Occurring in  $\geq$  10% of Subjects in a Double-Blind, Placebo-Controlled Study in Patients with Primary Hyperparathyroidism**

<b>Adverse Reaction</b>	<b>Placebo</b> (n = 34) n (%)	<b>Cinacalct</b> (n = 33) n (%)
Nausea	6 (18)	10 (30)
Muscle spasms	0 (0)	6 (18)
Headache	2 (6)	4 (12)
Back pain	2 (6)	4 (12)

n = Number of subjects receiving at least one dose of study drug Coded using MedDRA version 16.0.

### ***Hypocalcemia***

In 26-week studies of patients with secondary HPT and CKD on dialysis 66% of patients receiving cinacalct HCl compared with 25% of patients receiving placebo developed at least one serum calcium value less than 8.4 mg/dL, whereas, 29 % of patients receiving cinacalct HCl compared with 11% of patients receiving placebo developed at least one serum calcium value less than 7.5 mg/dL. Less than 1% of patients in each group permanently discontinued study drug due to hypocalcemia.

In a randomized, double-blind, placebo-controlled study in patients with secondary HPT and CKD receiving dialysis in which patients were treated for up to 64 months (mean duration of treatment was 21 months in the cinacalct group), 75% of patients receiving cinacalct HCl compared with 29% of patients receiving placebo developed at least one serum calcium value less than 8.4 mg/dL and 33% of cinacalct patients compared with 12% of patients receiving placebo had at least one serum calcium value less than 7.5 mg/dL. Most of the cases of severe hypocalcemia less than 7.5mg/dL (21/33=64%) occurred during the first 6 months. In this trial, 1.1% of patients receiving cinacalct HCl and 0.1% of patients receiving placebo permanently discontinued study drug due to hypocalcemia.

During a placebo-controlled part of a 52-week study in patients with primary HPT who

met criteria for parathyroidectomy on the basis of corrected total serum calcium ( $> 11.3$  mg/dL [ $2.82$  mmol/L] and  $\leq 12.5$  mg/dL [ $3.12$  mmol/L]), serum calcium less than  $8.4$  mg/dL was observed in  $6.1\%$  ( $2/33$ ) of cinacalcet HCl-treated patients and  $0\%$  ( $0/34$ ) of placebo-treated patients.

## 6.2 Postmarketing Experience

The following adverse reactions have been identified during post approval use of cinacalcet HCl. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure.

- Rash and hypersensitivity reactions (including angioedema and urticaria), and myalgia
- Isolated, idiosyncratic cases of hypotension, worsening heart failure, and/or arrhythmia have been reported in patients with impaired cardiac function
- Gastrointestinal bleeding
- Chondrocalcinosis pyrophosphate (acute pseudogout)

## 7 DRUG INTERACTIONS

### 7.1 Strong CYP3A4 Inhibitors

Cinacalcet is partially metabolized by CYP3A4. Dose adjustment of cinacalcet HCl may be required if a patient initiates or discontinues therapy with a strong CYP3A4 inhibitor (e.g., ketoconazole, itraconazole). The iPTH and serum calcium concentrations should be closely monitored in these patients [see *Clinical Pharmacology (12.3)*].

### 7.2 CYP2D6 Substrates

Cinacalcet is a strong inhibitor of CYP2D6. Dose adjustments may be required for concomitant medications that are predominantly metabolized by CYP2D6 (e.g., desipramine, metoprolol, and carvedilol) and particularly those with a narrow therapeutic index (e.g., flecainide and most tricyclic antidepressants) [see *Clinical Pharmacology (12.3)*].

## 8 USE IN SPECIFIC POPULATIONS

### 8.1 Pregnancy

#### Risk Summary

Limited case reports of cinacalcet HCl use in pregnant women are insufficient to inform a drug associated risk of adverse developmental outcomes. In animal reproduction studies, when female rats were exposed to cinacalcet during the period of organogenesis through to weaning at 2 to 3 times the systemic drug levels (based on AUC) at the maximum recommended human dose (MRHD) of  $180$  mg/day, peripartum and early postnatal pup loss and reduced pup body weight gain were observed in the presence of maternal hypocalcemia [see *Data*].

The estimated background risk of major birth defects and miscarriage for the indicated populations is unknown. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is  $2\%$  to  $4\%$

and 15% to 20%, respectively.

## Data

### *Animal Data*

In pregnant female rats given oral gavage doses of 2, 25, 50 mg/kg/day cinacalcet during gestation, no teratogenicity was observed at doses up to 50 mg/kg/day (exposure 4 times those resulting with a human oral dose of 180 mg/day based on AUC comparison). Decreased fetal body weights were observed at all doses (less than 1 to 4 times a human oral dose of 180 mg/day based on AUC comparison) in conjunction with maternal toxicity (decreased food consumption and body weight gain).

In pregnant female rabbits given oral gavage doses of 2, 12, 25 mg/kg/day cinacalcet during gestation, no adverse fetal effects were observed (exposures less than with a human oral dose of 180 mg/day based on AUC comparisons). Reductions in maternal food consumption and body weight gain were seen at doses of 12 and 25 mg/kg/day. Cinacalcet has been shown to cross the placental barrier in rabbits.

In pregnant rats given oral gavage doses of 5, 15, 25 mg/kg/day cinacalcet during gestation through lactation, no adverse fetal or pup (post-weaning) effects were observed at 5 mg/kg/day (exposures less than with a human therapeutic dose of 180 mg/day based on AUC comparisons). Higher doses of 15 and 25 mg/kg/day cinacalcet (exposures 2 to 3 times a human oral dose of 180 mg/day based on AUC comparisons) were accompanied by maternal signs of hypocalcemia (periparturient mortality and early postnatal pup loss), and reductions in postnatal maternal and pup body weight gain.

## **8.2 Lactation**

### Risk Summary

There are no data regarding the presence of cinacalcet HCl in human milk or effects on the breastfed infant or on milk production. Studies in rats showed that cinacalcet was excreted in the milk. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for cinacalcet HCl and any potential adverse effects on the breastfed infant from cinacalcet HCl or from the underlying maternal condition.

## **8.4 Pediatric Use**

The safety and efficacy of cinacalcet HCl have not been established in pediatric patients.

The use of cinacalcet HCl for the treatment of secondary HPT in pediatric patients with CKD on dialysis was evaluated in two randomized, controlled studies (Pediatric Study 1 and Study 2) where 47 pediatric patients aged 6 years to less than 18 years received at least one dose of cinacalcet HCl and in one single-arm study (Pediatric Study 3) where 17 pediatric patients aged 28 days to less than 6 years received at least one dose of cinacalcet HCl. Dosing with cinacalcet HCl in Pediatric Study 1 was stopped because of a fatality in a cinacalcet HCl-treated individual. The individual was noted to be severely hypocalcemic at the time of death. The cause of death was multifactorial and a contribution of cinacalcet HCl to the death could not be excluded [see *Warnings and Precautions (5.1)*]. Study 1 was terminated and changes to cinacalcet HCl dosing after the fatality were implemented in Pediatric Study 2 and Study 3 to minimize the risk of severe hypocalcemia. The data in Pediatric Studies 2 and 3 were insufficient to establish

the safety and efficacy of cinacalcet HCl for the treatment of secondary HPT in pediatric patients with CKD on dialysis. In aggregate, the pediatric studies did not establish a safe and effective cinacalcet HCl dosing regimen for the pediatric population.

### **8.5 Geriatric Use**

Of the total number of subjects (n=1136) in clinical studies of cinacalcet HCl, 26 percent were 65 and over, and 9 percent were 75 and over. No overall differences in the safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger subjects, but greater sensitivity of some older individuals cannot be ruled out [see *Clinical Studies (14)* and *Clinical Pharmacology (12.3)*].

### **8.6 Renal Impairment**

No dosage adjustment is necessary for renal impairment [see *Clinical Pharmacology (12.3)*].

### **8.7 Hepatic Impairment**

Patients with moderate and severe hepatic impairment should have serum calcium, serum phosphorus, and iPTH levels monitored closely throughout treatment with cinacalcet HCl because cinacalcet exposure ( $AUC_{0-\infty}$ ) is increased by 2.4 and 4.2 fold, respectively, in these patients [see *Clinical Pharmacology (12.3)*].

## **10 OVERDOSAGE**

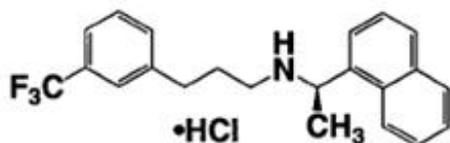
Overdosage of Cinacalcet HCl may lead to hypocalcemia. In the event of overdosage, patients should be monitored for signs and symptoms of hypocalcemia and appropriate measures taken to correct serum calcium levels [see *Warnings and Precautions (5.1)*].

Since cinacalcet HCl is highly protein bound, hemodialysis is not an effective treatment for overdosage of cinacalcet HCl.

## **11 DESCRIPTION**

Cinacalcet tablets contain the hydrochloride salt of the active ingredient cinacalcet, a positive modulator of the calcium sensing receptor. The empirical formula for cinacalcet is  $C_{22}H_{22}F_3N \cdot HCl$  with a molecular weight of 393.9 g/mol (hydrochloride salt) and 357.4 g/mol (free base). It has one chiral center having an R-absolute configuration. The R-enantiomer is the more potent enantiomer and has been shown to be responsible for pharmacodynamic activity. The hydrochloride salt of cinacalcet is a white to off-white, crystalline solid that is soluble in methanol or 95% ethanol and slightly soluble in water.

The hydrochloride salt of cinacalcet is described chemically as N-[1-(R)-(-)-(1-naphthyl)ethyl]-3-[3-(trifluoromethyl)phenyl]-1-aminopropane hydrochloride and has the following structural formula:



Cinacalcet tablets are formulated as green color, film-coated, oval-shaped tablets for oral administration in strengths of 30 mg, 60 mg, and 90 mg of cinacalcet as the free base equivalent (33 mg, 66 mg, and 99 mg as the hydrochloride salt, respectively).

### ***Inactive Ingredients***

The following are the inactive ingredients in cinacalcet tablets: colloidal silicon dioxide, crospovidone, D&C Yellow #10 aluminum lake, FD&C Blue #2/Indigo carmine aluminum lake, hypromellose, magnesium stearate, mannitol, microcrystalline cellulose, polyethylene glycol, polyvinyl alcohol, pregelatinized starch (corn), talc, and titanium dioxide.

## **12 CLINICAL PHARMACOLOGY**

### **12.1 Mechanism of Action**

The calcium-sensing receptor on the surface of the chief cell of the parathyroid gland is the principal regulator of PTH synthesis and secretion. Cinacalcet, the active ingredient in cinacalcet tablets, is a calcimimetic agent that directly lowers PTH levels by increasing the sensitivity of the calcium-sensing receptor to activation by extracellular calcium. The reduction in PTH is associated with a concomitant decrease in serum calcium levels.

### **12.2 Pharmacodynamics**

Reduction in iPTH levels correlated with the plasma cinacalcet concentrations in patients with CKD. The nadir in iPTH level occurs approximately 2 to 6 hours post dose, corresponding with the maximum plasma concentration ( $C_{max}$ ) of cinacalcet. After steady-state cinacalcet concentrations are reached (which occurs within 7 days of dose change), serum calcium concentrations remain constant over the dosing interval in patients with CKD.

Reductions in PTH are associated with a decrease in bone turnover and bone fibrosis in patients with CKD on dialysis and uncontrolled secondary HPT.

### **12.3 Pharmacokinetics**

#### ***Absorption and Distribution***

After oral administration of cinacalcet,  $C_{max}$  is achieved in approximately 2 to 6 hours. Cinacalcet  $C_{max}$  and  $AUC_{(0-infinite)}$  were increased by 82% and 68%, respectively, following administration with a high-fat meal compared with fasting in healthy volunteers. The  $C_{max}$  and  $AUC_{(0-infinite)}$  of cinacalcet were increased by 65% and 50%, respectively, when cinacalcet was administered with a low-fat meal compared with fasting.

After absorption, cinacalcet concentrations decline in a biphasic fashion with an initial

half-life of approximately 6 hours and a terminal half-life of 30 to 40 hours. Steady-state drug levels are achieved within 7 days, and the mean accumulation ratio is approximately 2 with once daily oral administration. The median accumulation ratio is approximately 2 to 5 with twice daily oral administration. The AUC and  $C_{\max}$  of cinacalcet increase proportionally over the dose range of 30 mg to 180 mg once daily. The pharmacokinetic profile of cinacalcet does not change over time with once daily dosing of 30 mg to 180 mg. The volume of distribution is approximately 1000 L, indicating extensive distribution. Cinacalcet is approximately 93% to 97% bound to plasma protein(s). The ratio of blood cinacalcet concentration to plasma cinacalcet concentration is 0.80 at a blood cinacalcet concentration of 10 ng/mL.

### **Metabolism and Excretion**

Cinacalcet is metabolized by multiple enzymes, primarily CYP3A4, CYP2D6, and CYP1A2. After administration of a 75 mg radiolabeled dose to healthy volunteers, cinacalcet was metabolized via: 1) oxidative N-dealkylation to hydrocinnamic acid and hydroxyhydrocinnamic acid, which are further metabolized via  $\beta$ -oxidation and glycine conjugation; the oxidative N-dealkylation process also generates metabolites that contain the naphthalene ring; and 2) oxidation of the naphthalene ring on the parent drug forming dihydrodiols, which are further conjugated with glucuronic acid. The plasma concentrations of the major circulating metabolites, including the cinnamic acid derivatives and glucuronidated dihydrodiols, markedly exceed the parent drug concentrations. The hydrocinnamic acid metabolite and glucuronide conjugates have minimal or no calcimimetic activity. Renal excretion of metabolites was the primary route of elimination of radioactivity. Approximately 80% of the dose was recovered in the urine and 15% in the feces.

### **Specific Populations**

#### **Age: Geriatric Population**

The pharmacokinetic profile of cinacalcet in geriatric patients (age  $\geq$  65 years, n = 12) is similar to that for patients who are < 65 years of age (n = 268) [see *Use in Specific Populations* (8.5)].

#### **Hepatic Impairment**

The disposition of a 50 mg cinacalcet HCl single dose was compared between patients with hepatic impairment and patients with normal hepatic function. Cinacalcet exposure ( $AUC_{(0-\infty)}$ ) was comparable between healthy volunteers and patients with mild hepatic impairment. However, in patients with moderate and severe hepatic impairment (as indicated by the Child-Pugh method), cinacalcet exposures ( $AUC_{(0-\infty)}$ ) were 2.4 and 4.2 fold higher, respectively, than that in healthy volunteers. The mean half-life of cinacalcet increased from 49 hours in healthy volunteers to 65 hours and 84 hours in patients with moderate and severe hepatic impairment, respectively. Protein binding of cinacalcet is not affected by impaired hepatic function [see *Use in Specific Populations* (8.7)].

#### **Renal Impairment**

The pharmacokinetic profile of a 75 mg cinacalcet HCl single dose in patients with mild, moderate, and severe renal impairment, and those on hemodialysis or peritoneal dialysis is comparable with that in healthy volunteers [see *Use in Specific Populations* (8.6)].

#### **Drug Interactions**

*In vitro* studies indicate that cinacalcet is a strong inhibitor of CYP2D6, but not an inhibitor of CYP1A2, CYP2C9, CYP2C19, and CYP3A4. *In vitro* induction studies indicate that cinacalcet is not an inducer of CYP450 enzymes. Tables 5 and 6 list the findings from *in vivo* drug-drug interaction studies.

**Table 5. Effect of co-administered drugs on cinacalcet**

Co-administered drug and dosing regimen	Cinacalcet		
	Dose*	Mean change in AUC <sub>(0-inf)</sub>	Mean change in C <sub>max</sub>
200 mg ketoconazole twice daily for 7 days	90 mg on day 5	↑127%	↑116%
1500 mg calcium carbonate, single dose	100 mg	↓6%	↓5%
80 mg pantoprazole daily for 3 days	90 mg on day 3	↑1%	↓3%
2400 mg sevelamer HCl three times a day for 2 days	90 mg on day 1 with first dose of sevelamer	↓4%	↓7%

\*Single dose.

**Table 6. Effect of cinacalcet co-administration on other drugs**

Cinacalcet dosing regimen	Co-administered drug		
	Name and Dose	Mean change in AUC <sub>(0-inf)</sub>	Mean change in C <sub>max</sub>
30 mg twice daily for 8 days	25 mg warfarin* tablet†	↑1 % for R-warfarin ↓1% for S-warfarin	↓10 % for R-warfarin ↓12 % for S-warfarin
90 mg daily for 7 days to CYP2D6 extensive metabolizers	50 mg desipramine†	↑264%	↑75%
90 mg daily for 5 days	2 mg midazolam†	↑5%	↓5%
25 or 100 mg single dose to CYP2D6 extensive metabolizers	50 mg amitriptyline single dose	↑21 to 22% for amitriptyline ↑17 to 23% for nortriptyline‡	↑13 to 21% for amitriptyline ↑11 to 15% for nortriptyline‡

\*No significant change in prothrombin time.

†Single dose on day 5.

‡Nortriptyline is an active metabolite of amitriptyline.

## **13 NONCLINICAL TOXICOLOGY**

### **13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility**

#### ***Carcinogenicity***

Standard lifetime dietary carcinogenicity bioassays were conducted in mice and rats. Mice were given cinacalcet at dietary doses of 15, 50, and 125 mg/kg/day in males and 30, 70, and 200 mg/kg/day in females (exposures up to 2 times those resulting with a human oral dose of 180 mg/day based on AUC comparison). Rats were given dietary doses of 5, 15, and 35 mg/kg/day in males and 5, 20, and 35 mg/kg/day in females (exposures up to 2 times those resulting with a human oral dose of 180 mg/day based on AUC comparison). No increased incidence of tumors was observed following treatment with cinacalcet.

#### ***Mutagenicity***

Cinacalcet was not genotoxic in the Ames bacterial mutagenicity assay, nor in the Chinese Hamster Ovary (CHO) cell HGPRT forward mutation assay and CHO cell chromosomal aberration assay, with and without metabolic activation, nor in the *in vivo* mouse micronucleus assay.

#### ***Impairment of Fertility***

Female rats were given oral gavage doses of 5, 25, and 75 mg/kg/day cinacalcet beginning 2 weeks before mating and continuing through gestation day 7. Male rats were given oral doses 4 weeks prior to mating, during mating (3 weeks) and 2 weeks postmating. No effects were observed in male or female fertility at 5 and 25 mg/kg/day (exposures up to 3 times those resulting with a human oral dose of 180 mg/day based on AUC comparison). At 75 mg/kg/day, there were slight adverse effects (slight decreases in body weight and food consumption) in males and females.

## **14 CLINICAL STUDIES**

### **14.1 Secondary Hyperparathyroidism in Patients with Chronic Kidney Disease on Dialysis**

Three 6-month, multicenter, randomized, double-blind, placebo-controlled clinical studies of similar design were conducted in patients with CKD on dialysis. A total of 665 patients were randomized to cinacalcet HCl and 471 patients to placebo. The mean age of the patients was 54 years, 62% were male, and 52% were Caucasian. The average baseline iPTH level by the Nichols IRMA was 712 pg/mL, with 26% of the patients having a baseline iPTH level > 800 pg/mL. The mean baseline Ca x P product was 61 mg<sup>2</sup>/dL<sup>2</sup>. The average duration of dialysis prior to study enrollment was 67 months. Ninety-six percent of patients were on hemodialysis and 4% on peritoneal dialysis. At study entry, 66% of the patients were receiving vitamin D sterols and 93% were receiving phosphate binders. Cinacalcet HCl (or placebo) was initiated at a dose of 30 mg once daily and titrated every 3 or 4 weeks to a maximum dose of 180 mg once daily to achieve an iPTH of ≤ 250

pg/mL. The dose was not increased if a patient had any of the following: iPTH  $\leq$  200 pg/mL, serum calcium  $<$  7.8 mg/dL, or any symptoms of hypocalcemia. If a patient experienced symptoms of hypocalcemia or had a serum calcium  $<$  8.4 mg/dL, calcium supplements and/or calcium-based phosphate binders could be increased. If these measures were insufficient, the vitamin D dose could be increased. Approximately 70% of patients in the cinacalcet HCl arm and 80% of the patients in the placebo arm completed the 6-month studies. In the primary efficacy analysis, 40% of the patients on cinacalcet HCl and 5% of placebo-treated patients achieved an iPTH  $\leq$  250 pg/mL ( $p < 0.001$ ) (Table 6, Figure 1). These studies showed that cinacalcet HCl reduced iPTH while lowering Ca x P, calcium, and phosphorus levels (Table 6, Figure 2). The median dose of cinacalcet HCl at the completion of the studies was 90 mg. Patients with milder disease typically required lower doses.

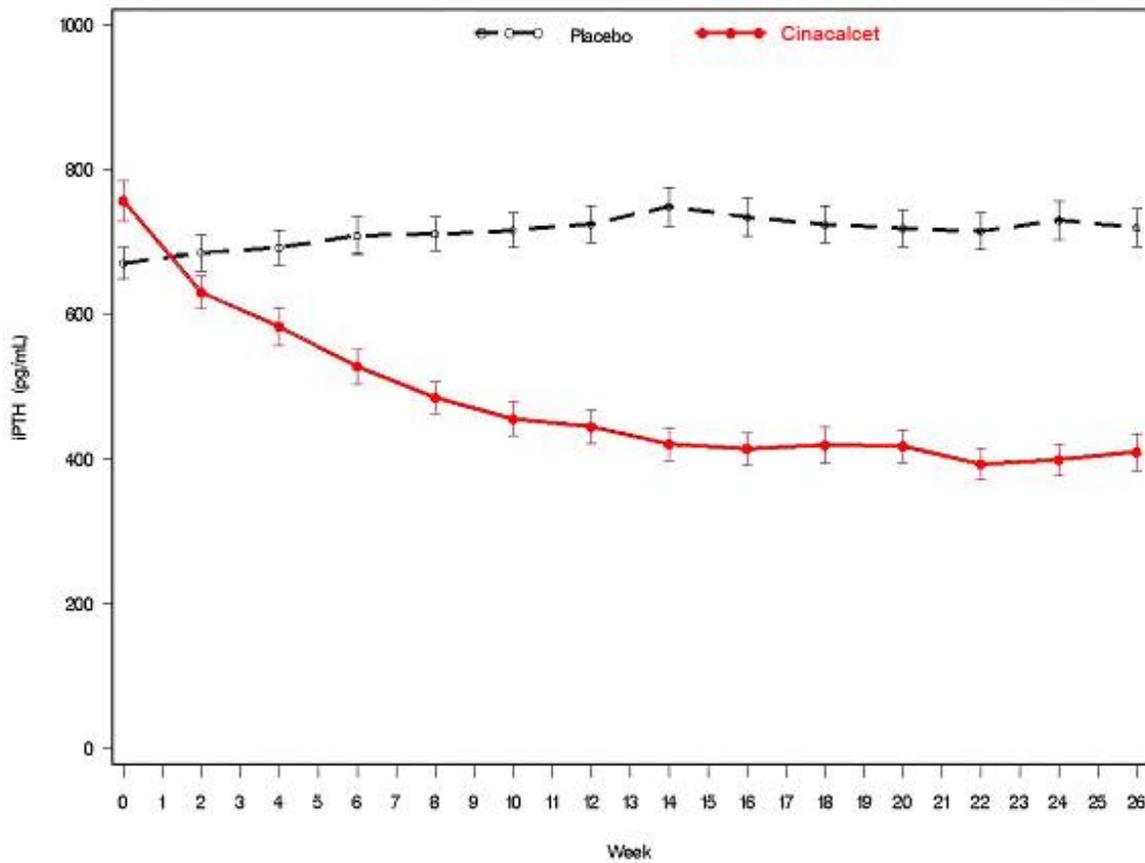
Similar results were observed when either the iPTH or bioactive PTH (biPTH) assay was used to measure PTH levels in CKD patients on dialysis; treatment with cinacalcet did not alter the relationship between iPTH and biPTH.

**Table 7. Effects of Cinacalcet HCl on iPTH, Ca x P, Serum Calcium, and Serum Phosphorus in 6-month Phase 3 Studies (Patients on Dialysis)**

	Study 1		Study 2		Study 3	
	Placebo (n = 205)	Cinacalcet HCl (n = 205)	Placebo (n = 165)	Cinacalcet HCl (n = 166)	Placebo (n = 101)	Cinacalcet HCl (n = 294)
iPTH						
Baseline (pg/mL): Median	535	537	556	547	670	703
Mean (SD)	651 (398)	636 (341)	630 (317)	652 (372)	832 (486)	848 (685)
Evaluation Phase (pg/mL)	563	275	592	238	737	339
Median Percent Change	+3.8	-48.3	+8.4	-54.1	+2.3	-48.2
Patients Achieving Primary Endpoint (iPTH $\leq$ 250 pg/mL) (%) <sup>a</sup>	4%	41%**	7%	46%**	6%	35%**
Patients Achieving $\geq$ 30% Reduction in iPTH (%) <sup>a</sup>	11%	61%	12%	68%	10%	59%
Patients Achieving iPTH $\leq$ 250 pg/mL and Ca x P $<$ 55 mg <sup>2</sup> /dL <sup>2</sup> (%)	1%	32%	5%	35%	5%	28%
Ca x P						
Baseline (mg <sup>2</sup> /dL <sup>2</sup> )	62	61	61	61	61	59

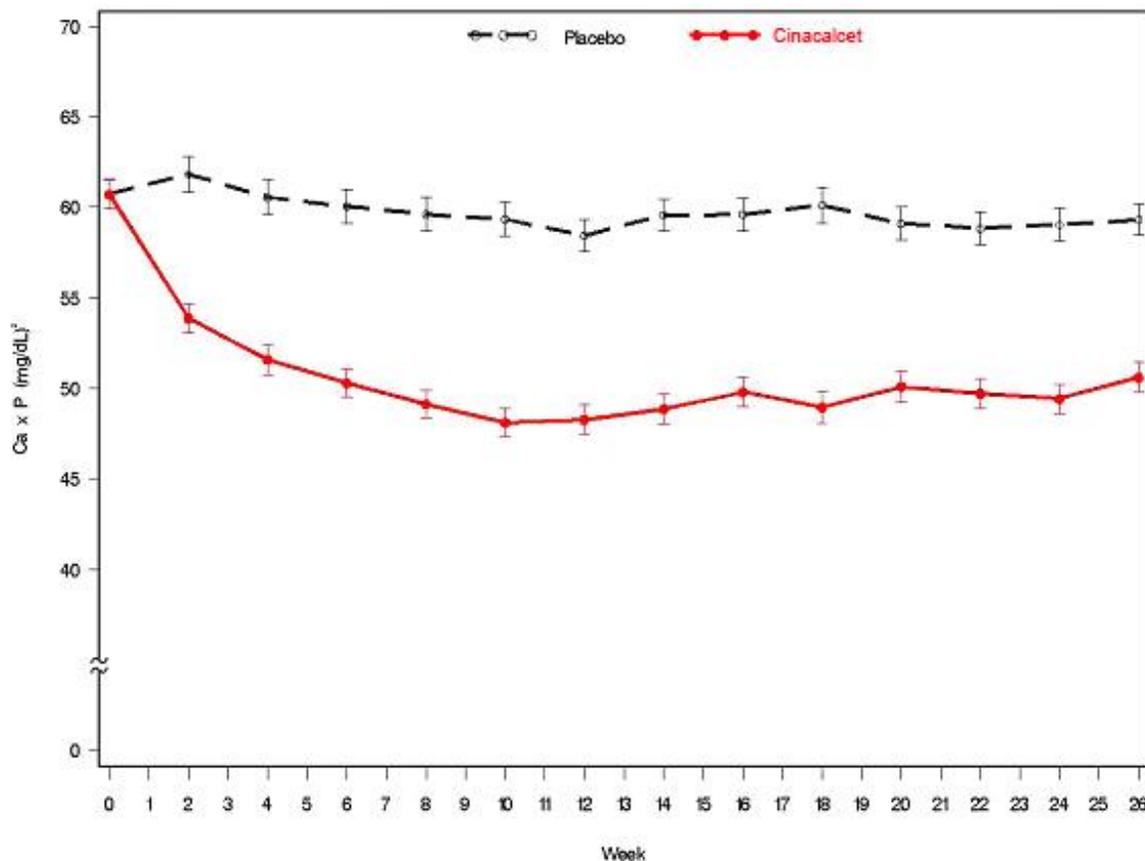
Evaluation Phase (mg <sup>2</sup> /dL <sup>2</sup> )	59	52	59	47	57	48
Median Percent Change	-2	-14.9	-3.1	-19.7	-4.8	-15.7
Calcium						
Baseline (mg/dL)	9.8	9.8	9.9	10	9.9	9.8
Evaluation Phase (mg/dL)	9.9	9.1	9.9	9.1	10	9.1
Median Percent Change	+0.5	-5.5	+0.1	-7.4	+0.3	-6
Phosphorus						
Baseline (mg/dL)	6.3	6.1	6.1	6	6.1	6
Evaluation Phase (mg/dL)	6	5.6	5.9	5.1	5.6	5.3
Median Percent Change	-1	-9	-2.4	-12.4	-5.6	-8.6
** p < 0.001 compared with placebo; p-values presented for primary endpoint only						
<sup>a</sup> iPTH value based on averaging over the evaluation phase (defined as weeks 13 to 26 in studies 1 and 2, and weeks 17 to 26 in study 3). Values shown are medians unless indicated otherwise.						

**Figure 1. Mean (SE) iPTH Values (Pooled Phase 3 Studies)**



Data are presented for patients who completed the studies; Placebo (n = 342), Cinacalcet HCl (n = 439).

**Figure 2. Mean (SE) Ca x P Values (Pooled Phase 3 Studies)**



Data are presented for patients who completed the studies; Placebo (n = 342), Cinacalcet HCl (n = 439).

Reductions in iPTH and Ca x P were maintained for up to 12 months of treatment.

Cinacalcet HCl decreased iPTH and Ca x P levels regardless of disease severity (i.e., baseline iPTH value), duration of dialysis, and whether or not vitamin D sterols were administered. Approximately 60% of patients with mild (iPTH  $\geq 300$  to  $\leq 500$  pg/mL), 41% with moderate (iPTH  $> 500$  to  $800$  pg/mL), and 11% with severe (iPTH  $> 800$  pg/mL) secondary HPT achieved a mean iPTH value of  $\leq 250$  pg/mL. Plasma iPTH levels were measured using the Nichols IRMA.

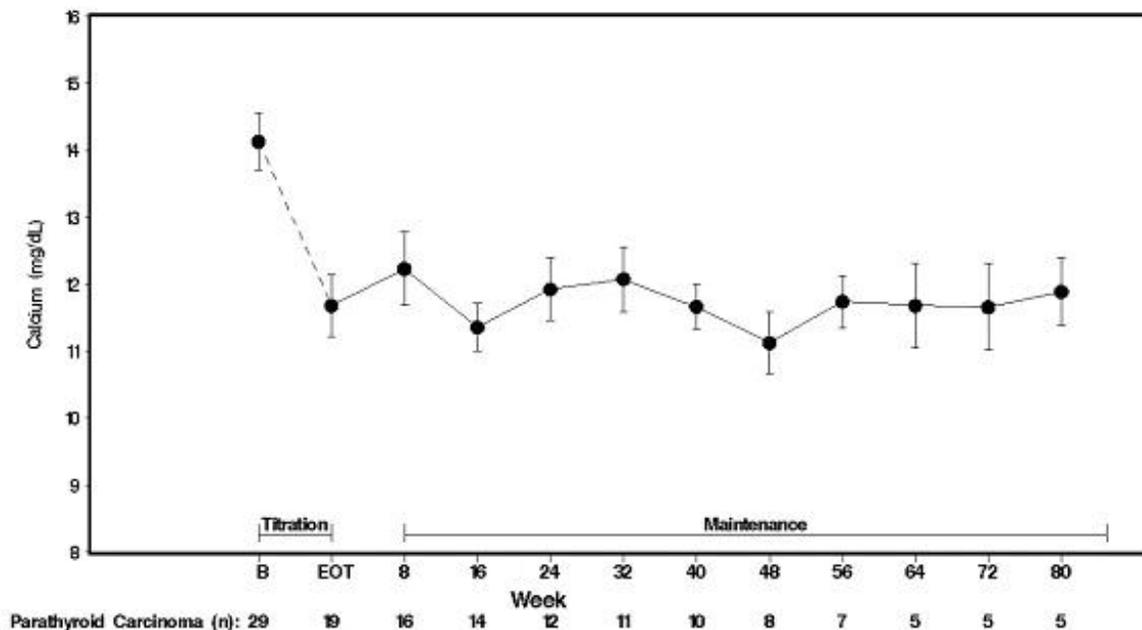
## 14.2 Parathyroid Carcinoma

Twenty-nine patients with Parathyroid Carcinoma were enrolled in a single-arm, open-label study. The study consisted of two phases, a dose-titration phase and a maintenance phase. Patients initially received 30 mg cinacalcet twice daily and then were titrated every 2 weeks to a maximum dose of 90 mg four times daily. Dosage escalation during the variable-length (2 to 16 weeks) titration phase continued until the serum calcium concentration was  $\leq 10$  mg/dL (2.5 mmol/L), the patient reached the highest possible dosage, or adverse events precluded further dosage increases.

Twenty-nine patients entered the study. The median exposure to cinacalcet was 229 days (range: 1 to 1051). At baseline the mean (SE) serum calcium was 14.1 (0.4) mg/dL. At the end of the titration phase, the mean (SE) serum calcium was 12.4 (0.5) mg/dL, which is a mean reduction of 1.7 (0.6) mg/dL from baseline. Figure 3 illustrates mean serum calcium (mg/dL) over time for all patients still on study at each time point from

the beginning of titration to study visit week 80. Daily dose during the study ranged from 30 mg twice daily to 90 mg four times daily.

**Figure 3. Serum Calcium Values in Patients with Parathyroid Carcinoma Receiving Cinacalcet HCl at Baseline, Titration, and Maintenance Phase**



n = Number of patients with non-missing values at the timepoint.

End of Titration (EOT) phase could occur at any visit from week 2 to 16. Patients at EOT are those who completed titration.

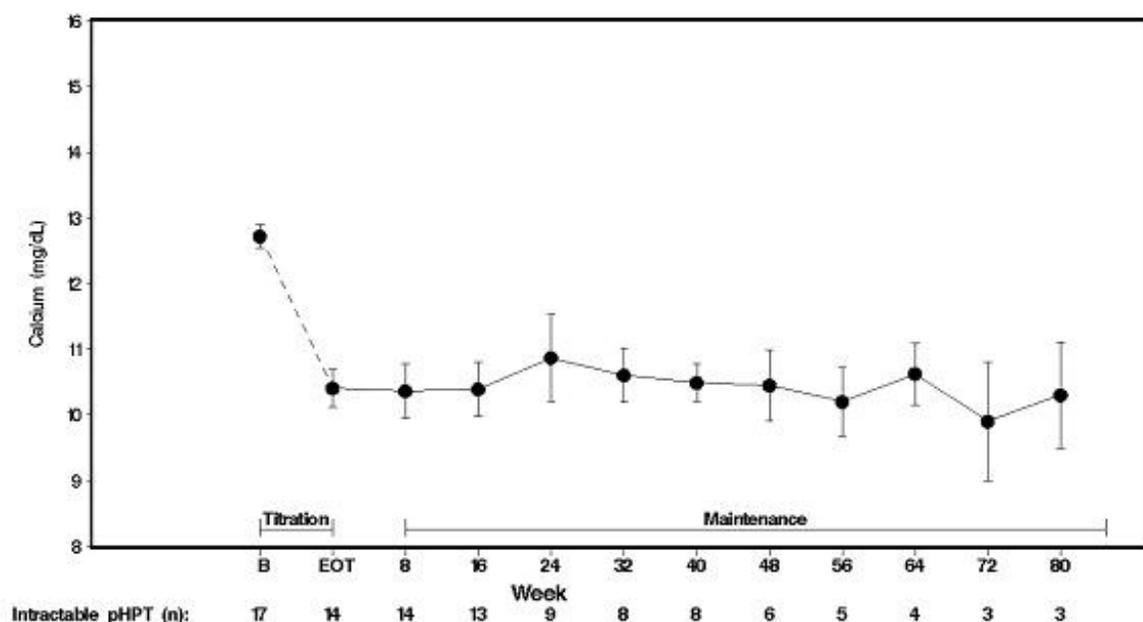
### 14.3 Patients with Hypercalcemia Due to Primary Hyperparathyroidism

Seventeen patients with severe hypercalcemia due to primary HPT, who had failed or had contraindications to parathyroidectomy, participated in an open-label, single-arm study. The study consisted of two phases, a dose-titration phase and a maintenance phase. In this trial, severe hypercalcemia was defined as a screening serum calcium level of > 12.5 mg/dL. Patients initially received 30 mg cinacalcet twice daily and then were titrated every 2 weeks to a maximum dose of 90 mg 4 times daily. Dosage escalation during the variable-length (2 to 16 weeks) titration phase continued until the serum calcium concentration was  $\leq 10$  mg/dL (2.5 mmol/L), the patient reached the highest possible dosage, or adverse events precluded further dosage increases.

Seventeen patients entered the study. The median exposure to cinacalcet was 270 days (range: 32 to 1,105). At baseline the mean (SE) serum calcium was 12.7 (0.2) mg/dL. At the end of the titration phase the mean (SE) serum calcium was 10.4 (0.3) mg/dL, which is a mean reduction of 2.3 (0.3) mg/dL from baseline. Figure 4 illustrates mean serum calcium (mg/dL) over time for all patients still on study at each time point from the beginning of titration to study visit week 80. Daily dose during the study ranged from 30 mg twice a day to 90 mg four times a day.

**Figure 4. Mean Serum Calcium (SE) at Baseline, End of Titration, and**

## Scheduled Maintenance Visits (Patients with Severe intractable primary HPT)



n = Number of patients with non-missing values at the timepoint.

End of Titration (EOT) phase could occur at any visit from week 2 to 16. Patients at EOT are those who completed titration.

Sixty-seven patients with primary HPT who met criteria for parathyroidectomy on the basis of corrected total serum calcium ( $> 11.3$  mg/dL [ $2.82$  mmol/L] and  $\leq 12.5$  mg/dL [ $3.12$  mmol/L]), but who were unable to undergo parathyroidectomy participated in a randomized, double-blind, placebo-controlled study. A total of 33 patients were randomized to cinacalcet HCl and 34 patients randomized to placebo. The mean age of the patients was 72 years, 52% were female, 61% were Caucasian, and 5% were Blacks. The study started with a 12-week titration phase, followed by a 16-week efficacy-assessment phase. Cinacalcet was initiated at a dose of 30 mg twice daily and titrated to maintain a corrected total serum calcium concentration within the normal range. During the efficacy period a significantly higher percentage of cinacalcet-treated patients compared with the placebo-treated patients achieved mean corrected total serum calcium concentration ( $\leq 10.3$  mg/dL [ $2.57$  mmol/L], 75.8% vs 0%,  $p < 0.001$ ) and  $\geq 1$  mg/dL [ $0.25$  mmol/L] decrease from baseline in mean corrected total serum calcium concentration (84.8% vs 5.9%,  $p < 0.001$ ). The median dose of cinacalcet HCl at the completion of the study was 60 mg/day.

## 16 HOW SUPPLIED/STORAGE AND HANDLING

Cinacalcet tablets, **30 mg** are formulated as green color, film-coated, oval-shaped tablets debossed with "155" on one side and plain on the other side.

They are available as follows:

Bottles of 30: NDC 65162-155-03

Bottles of 100: NDC 65162-155-10

Bottles of 250: NDC 65162-155-25

Cinacalcet tablets, **60 mg** are formulated as green color, film-coated, oval-shaped tablets debossed with “157” on one side and plain on the other side.

They are available as follows:

Bottles of 30: NDC 65162-157-03

Bottles of 100: NDC 65162-157-10

Bottles of 250: NDC 65162-157-25

Cinacalcet tablets, **90 mg** are formulated as green color, film-coated, oval-shaped tablets debossed with “213” on one side and plain on the other side.

They are available as follows:

Bottles of 30: NDC 65162-213-03

Bottles of 100: NDC 65162-213-10

Bottles of 250: NDC 65162-213-25

### **Storage**

Store at 20° to 25°C (68° to 77°F); excursions permitted between 15° to 30°C (59° to 86°F) [see USP Controlled Room Temperature].

## **17 PATIENT COUNSELING INFORMATION**

- *Hypocalcemia*: Advise patients to report symptoms of hypocalcemia, including paresthesias, myalgias, muscle spasms, and seizures, to their healthcare provider [see *Warnings and Precautions (5.1)*].
- *Upper Gastrointestinal Bleeding*: Advise patients to report any symptoms of upper gastrointestinal bleeding to their health care provider [see *Warnings and Precautions (5.2)*].
- *Heart Failure*: Advise patients with heart failure that use of cinacalcet HCl may worsen their heart failure and additional monitoring may be required [see *Warnings and Precautions (5.3)*].
- Advise patients to report nausea and vomiting to their health care provider [see *Adverse Reactions (6.1)*].
- Advise patients to take cinacalcet HCl with food or shortly after a meal and to take the tablets whole and not divide them [see *Dosage and Administration (2.1)*].
- Inform patients of the importance of regular blood tests, in order to monitor the safety and efficacy of cinacalcet HCl therapy.

Distributed by:

**Amneal Pharmaceuticals LLC**

Bridgewater, NJ 08807

Rev. 08-2021-00

**PACKAGE LABEL.PRINCIPAL DISPLAY PANEL**

NDC 65162-155-10

# Cinacalcet Tablets

30 mg

155

Rx only  
100 Tablets



**Each film-coated tablet contains:**

33 mg of cinacalcet hydrochloride equivalent to 30 mg of cinacalcet.

**Usual Dosage:** See package insert.

Store at 20° to 25°C (68° to 77°F); excursions permitted between 15° to 30°C (59° to 86°F) [see USP Controlled Room Temperature]. Dispense in a tight, light-resistant container per USP.

**Keep this and all medication out of the reach of children.**

Distributed by: **Amneal Pharmaceuticals LLC**  
Bridgewater, NJ 08807

Rev. 08-2021-00



N 3 65162 15510 5

1.5" x 0.75"

Non-Varnish Area for Lot No. and Exp Date and Serialization

NDC 65162-157-10

# Cinacalcet Tablets

60 mg

157

Rx only  
100 Tablets



**Each film-coated tablet contains:**

66 mg of cinacalcet hydrochloride equivalent to 60 mg of cinacalcet.

**Usual Dosage:** See package insert.

Store at 20° to 25°C (68° to 77°F); excursions permitted between 15° to 30°C (59° to 86°F) [see USP Controlled Room Temperature].

Dispense in a tight, light-resistant container per USP.

**Keep this and all medication out of the reach of children.**

Distributed by: **Amneal Pharmaceuticals LLC**  
Bridgewater, NJ 08807

Rev. 08-2021-00



N 3 65162 15710 9

1.625" x 0.75"

Non-Varnish Area for Lot No. and Exp Date and Serialization

NDC 65162-213-10

# Cinacalcet Tablets

90 mg

213

Rx only  
100 Tablets



**Each film-coated tablet contains:**

99 mg of cinacalcet hydrochloride equivalent to 90 mg of cinacalcet.

**Usual Dosage:** See package insert.

Store at 20° to 25°C (68° to 77°F); excursions permitted between 15° to 30°C (59° to 86°F) [see USP Controlled Room Temperature].

Dispense in a tight, light-resistant container per USP.

**Keep this and all medication out of the reach of children.**

Distributed by: **Amneal Pharmaceuticals LLC**  
Bridgewater, NJ 08807

Rev. 08-2021-00



N 3 65162 21310 2

2" x 0.75"

Non-Varnish Area for Lot No. and Exp Date and Serialization

## CINACALCET HYDROCHLORIDE

cinacalcet tablet

### Product Information

<b>Product Type</b>	HUMAN PRESCRIPTION DRUG	<b>Item Code (Source)</b>	NDC:65162-155
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<b>Route of Administration</b>	ORAL
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**Active Ingredient/Active Moiety**

Ingredient Name	Basis of Strength	Strength
<b>CINACALCET HYDROCHLORIDE</b> (UNII: 1K860WSG25) (CINACALCET - UNII:UAZ 6V77285)	CINACALCET	30 mg

**Inactive Ingredients**

Ingredient Name	Strength
<b>CROSPVIDONE</b> (UNII: 2S7830E561)	
<b>D&amp;C YELLOW NO. 10</b> (UNII: 35SW5USQ3G)	
<b>HYPROMELLOSES</b> (UNII: 3NXW29V3WO)	
<b>SILICON DIOXIDE</b> (UNII: ETJ7Z6XBU4)	
<b>FD&amp;C BLUE NO. 2</b> (UNII: L06K8R7DQK)	
<b>POLYETHYLENE GLYCOL, UNSPECIFIED</b> (UNII: 3WJQ0SDW1A)	
<b>MAGNESIUM STEARATE</b> (UNII: 70097M6I30)	
<b>MANNITOL</b> (UNII: 3OWL53L36A)	
<b>CELLULOSE, MICROCRYSTALLINE</b> (UNII: OP1R32D61U)	
<b>POLYVINYL ALCOHOL, UNSPECIFIED</b> (UNII: 532B59J990)	
<b>STARCH, CORN</b> (UNII: O8232NY3SJ)	
<b>TALC</b> (UNII: 7SEV7J4R1U)	
<b>TITANIUM DIOXIDE</b> (UNII: 15FIX9V2JP)	

**Product Characteristics**

<b>Color</b>	green	<b>Score</b>	no score
<b>Shape</b>	OVAL	<b>Size</b>	10mm
<b>Flavor</b>		<b>Imprint Code</b>	155
<b>Contains</b>			

**Packaging**

#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:65162-155-03	30 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	
2	NDC:65162-155-10	100 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	
3	NDC:65162-155-25	250 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	

**Marketing Information**

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
ANDA	ANDA204364	12/06/2021	

# CINACALCET HYDROCHLORIDE

cinacalcet tablet

## Product Information

<b>Product Type</b>	HUMAN PRESCRIPTION DRUG	<b>Item Code (Source)</b>	NDC:65162-157
<b>Route of Administration</b>	ORAL		

## Active Ingredient/Active Moiety

Ingredient Name	Basis of Strength	Strength
<b>CINACALCET HYDROCHLORIDE</b> (UNII: 1K860WSG25) (CINACALCET - UNII:UAZ6V7728S)	CINACALCET	60 mg

## Inactive Ingredients

Ingredient Name	Strength
<b>CROSPVIDONE</b> (UNII: 2S7830E561)	
<b>D&amp;C YELLOW NO. 10</b> (UNII: 35SW5USQ3G)	
<b>HYPROMELLOSES</b> (UNII: 3NXW29V3WO)	
<b>SILICON DIOXIDE</b> (UNII: ETJ7Z6XBU4)	
<b>FD&amp;C BLUE NO. 2</b> (UNII: L06K8R7DQK)	
<b>POLYETHYLENE GLYCOL, UNSPECIFIED</b> (UNII: 3WJQ0SDW1A)	
<b>MAGNESIUM STEARATE</b> (UNII: 70097M6I30)	
<b>MANNITOL</b> (UNII: 3OWL53L36A)	
<b>CELLULOSE, MICROCRYSTALLINE</b> (UNII: OP1R32D61U)	
<b>POLYVINYL ALCOHOL, UNSPECIFIED</b> (UNII: 532B59J990)	
<b>STARCH, CORN</b> (UNII: O8232NY3SJ)	
<b>TALC</b> (UNII: 7SEV7J4R1U)	
<b>TITANIUM DIOXIDE</b> (UNII: 15FIX9V2JP)	

## Product Characteristics

<b>Color</b>	green	<b>Score</b>	no score
<b>Shape</b>	OVAL	<b>Size</b>	12mm
<b>Flavor</b>		<b>Imprint Code</b>	157
<b>Contains</b>			

## Packaging

#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:65162-157-03	30 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	
2	NDC:65162-157-10	100 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	
3	NDC:65162-157-25	250 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	

## Marketing Information

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
ANDA	ANDA204364	12/06/2021	

## CINACALCET HYDROCHLORIDE

cinacalcet tablet

### Product Information

Product Type	HUMAN PRESCRIPTION DRUG	Item Code (Source)	NDC:65162-213
Route of Administration	ORAL		

### Active Ingredient/Active Moiety

Ingredient Name	Basis of Strength	Strength
CINACALCET HYDROCHLORIDE (UNII: 1K860WSG25) (CINACALCET - UNII:UAZ6V7728S)	CINACALCET	90 mg

### Inactive Ingredients

Ingredient Name	Strength
CROSPVIDONE (UNII: 2S7830E561)	
D&C YELLOW NO. 10 (UNII: 35SW5USQ3G)	
HYPROMELLOSES (UNII: 3NXW29V3WO)	
SILICON DIOXIDE (UNII: ETJ7Z6XBU4)	
FD&C BLUE NO. 2 (UNII: L06K8R7DQK)	
POLYETHYLENE GLYCOL, UNSPECIFIED (UNII: 3WJQ05DW1A)	
MAGNESIUM STEARATE (UNII: 70097M6I30)	
MANNITOL (UNII: 3OWL53L36A)	
CELLULOSE, MICROCRYSTALLINE (UNII: OP1R32D61U)	
POLYVINYL ALCOHOL, UNSPECIFIED (UNII: 532B59J990)	
STARCH, CORN (UNII: O8232NY3SJ)	
TALC (UNII: 7SEV7J4R1U)	
TITANIUM DIOXIDE (UNII: 15FIX9V2JP)	

### Product Characteristics

Color	green	Score	no score
Shape	OVAL	Size	14mm
Flavor		Imprint Code	213
Contains			

## Packaging

#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:65162-213-03	30 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	
2	NDC:65162-213-10	100 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	
3	NDC:65162-213-25	250 in 1 BOTTLE; Type 0: Not a Combination Product	12/06/2021	

## Marketing Information

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
ANDA	ANDA204364	12/06/2021	

**Labeler** - Amneal Pharmaceuticals LLC (123797875)

## Establishment

Name	Address	ID/FEI	Business Operations
Amneal Pharmaceuticals of New York, LLC		123797875	analysis(65162-155, 65162-157, 65162-213) , label(65162-155, 65162-157, 65162-213) , manufacture(65162-155, 65162-157, 65162-213) , pack(65162-155, 65162-157, 65162-213)

Revised: 8/2021

Amneal Pharmaceuticals LLC