

# CREON- pancrelipase capsule, delayed release pellets

## Atlantic Biologicals Corps

-----

### HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use CREON safely and effectively. See full prescribing information for CREON. CREON (pancrelipase) delayed-release capsules for oral use Initial U.S. Approval: 2009

### ----- RECENT MAJOR CHANGES -----

Dosage and Administration, ( ) 6/2011 *Infants (up to 12 months)* 2.1

Dosage and Administration ( ) 6/2011 2.2

Dosage and Administration, ( ) 6/2011 *Infants (up to 12 months)* 2.2

### ----- INDICATIONS AND USAGE -----

CREON is a combination of porcine-derived lipases, proteases, and amylases indicated for the treatment of exocrine pancreatic insufficiency due to cystic fibrosis, chronic pancreatitis, pancreatectomy, or other conditions. ( ) 1

### ----- DOSAGE AND ADMINISTRATION -----

CREON is not interchangeable with any other pancrelipase product. ( ) 2.1

Do not crush or chew capsules and capsule contents. For infants or patients unable to swallow intact capsules, the contents may be sprinkled on soft acidic food, e.g., applesauce. ( ) Dosing should not exceed the recommended maximum dosage set forth by the Cystic Fibrosis Foundation Consensus Conferences Guidelines. ( ) 2.12.2

#### Infants (up to 12 months)

- Prior to each feeding, infants may be given 3,000 lipase units (one capsule) per 120 mL of formula or per breast-feeding. ( ) 2.1
- Do not mix CREON capsule contents directly into formula or breast milk prior to administration. ( ) 2.1

#### Children Older than 12 Months and Younger than 4 Years

- Begin with 1,000 lipase units/kg of body weight per meal for children less than age 4 years to a maximum of 2,500 lipase units/kg of body weight per meal (or less than or equal to 10,000 lipase units/kg of body weight per day), or less than 4,000 lipase units/g fat ingested per day. ( ) 2.2

#### Children 4 Years and Older and Adults

- Begin with 500 lipase units/kg of body weight per meal for those older than age 4 years to a maximum of 2,500 lipase units/kg of body weight per meal (or less than or equal to 10,000 lipase units/kg of body weight per day), or less than 4,000 lipase units/g fat ingested per day. ( ) 2.2

#### Adults with Exocrine Pancreatic Insufficiency Due to Chronic Pancreatitis or Pancreatectomy

- Individualize dosage based on clinical symptoms, the degree of steatorrhea present and the fat content of the diet. ( ) 2.2

### ----- DOSAGE FORMS AND STRENGTHS -----

- Delayed-Release Capsules: 3,000 USP units of lipase; 9,500 USP units of protease; 15,000 USP units of amylase ( ) 3
- Delayed-Release Capsules: 6,000 USP units of lipase; 19,000 USP units of protease; 30,000 USP units of amylase ( ) 3
- Delayed-Release Capsules: 12,000 USP units of lipase; 38,000 USP units of protease; 60,000 USP units of amylase ( ) 3
- Delayed-Release Capsules: 24,000 USP units of lipase; 76,000 USP units of protease; 120,000 USP units of amylase ( ) 3

### ----- CONTRAINDICATIONS -----

None ( ) 4

### ----- WARNINGS AND PRECAUTIONS -----

- Fibrosing colonopathy is associated with high-dose use of pancreatic enzyme replacement in the treatment of cystic fibrosis patients. Exercise caution when doses of CREON exceed 2,500 lipase units/kg of body weight per meal (or greater than 10,000 lipase units/kg of body weight per day). ( ) 5.1
- To avoid irritation of oral mucosa, do not chew CREON or retain in the mouth. ( ) 5.2
- Exercise caution when prescribing CREON to patients with gout, renal impairment, or hyperuricemia. ( ) 5.3
- There is the oretical risk of viral transmission with all pancreatic enzyme products including CREON. ( ) 5.4
- Exercise caution when administering pancrelipase to a patient with a known allergy to proteins of porcine origin. ( ) 5.5

### ----- ADVERSE REACTIONS -----

- Adverse reactions occurring in at least 2 cystic fibrosis patients (greater than or equal to 4%) receiving CREON are

vomiting, dizziness, and cough. ( ) 6.1

- Adverse reactions that occurred in at least 1 chronic pancreatitis or pancreatectomy patient (greater than or equal to 4%) receiving CREON are hyperglycemia, hypoglycemia, abdominal pain, abnormal feces, flatulence, frequent bowel movements, and nasopharyngitis. ( ) 6.1

**To report SUSPECTED ADVERSE REACTIONS, contact Abbott Laboratories at 1-800-241-1643 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).**

**See 17 for PATIENT COUNSELING INFORMATION and Medication Guide.**

**Revised: 7/2011**

---

## **FULL PRESCRIBING INFORMATION: CONTENTS\***

### **1 INDICATIONS AND USAGE**

### **2 DOSAGE AND ADMINISTRATION**

2.1 Administration

2.2 Dosage

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

### **4 CONTRAINDICATIONS**

### **5 WARNINGS AND PRECAUTIONS**

5.1 Fibrosing Colonopathy

5.2 Potential for Irritation to Oral Mucosa

5.3 Potential for Risk of Hyperuricemia

5.4 Potential Viral Exposure from the Product Source

5.5 Allergic Reactions

### **6 ADVERSE REACTIONS**

6.1 Clinical Trials Experience

6.2 Postmarketing Experience

### **7 DRUG INTERACTIONS**

### **8 USE IN SPECIFIC POPULATIONS**

8.1 Pregnancy

8.3 Nursing Mothers

8.4 Pediatric Use

8.5 Geriatric Use

### **10 OVERDOSAGE**

### **11 DESCRIPTION**

### **12 CLINICAL PHARMACOLOGY**

12.1 Mechanism of Action

12.3 Pharmacokinetics

### **13 NONCLINICAL TOXICOLOGY**

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

### **14 CLINICAL STUDIES**

14.1 Cystic Fibrosis

14.2 Chronic Pancreatitis or Pancreatectomy

### **15 REFERENCES**

### **17 PATIENT COUNSELING INFORMATION**

17.1 Dosing and Administration

17.2 Fibrosing Colonopathy

17.3 Allergic Reactions

17.4 Pregnancy and Breast Feeding

\* Sections or subsections omitted from the full prescribing information are not listed.

---

## FULL PRESCRIBING INFORMATION

### 1 INDICATIONS AND USAGE

CREON (pancrelipase) is indicated for the treatment of exocrine pancreatic insufficiency due to cystic fibrosis, chronic pancreatitis, pancreatectomy, or other conditions. ®

### 2 DOSAGE AND ADMINISTRATION

CREON is not interchangeable with other pancrelipase products.

CREON is orally administered. Therapy should be initiated at the lowest recommended dose and gradually increased. The dosage of CREON should be individualized based on clinical symptoms, the degree of steatorrhea present, and the fat content of the diet as described in the Limitations on Dosing below. [see Dosage and Administration ( ) and Warnings and Precautions ( )] 2.25.1

#### 2.1 Administration

##### Infants (up to 12 months)

CREON should be administered to infants immediately prior to each feeding, using a dosage of lipase units per 120 mL of formula or prior to breast-feeding. Contents of the capsule may be administered directly to the mouth or with a small amount of applesauce. Administration should be followed by breast milk or formula. Contents of the capsule be mixed directly into formula or breast milk as this may diminish efficacy. Care should be taken to ensure that CREON is not crushed or chewed or retained in the mouth, to avoid irritation of the oral mucosa. 3,000 should not

##### Children and Adults

CREON should be taken during meals or snacks, with sufficient fluid. Capsules should be swallowed whole. CREON capsules and capsule contents should not be crushed or chewed.

For patients who are unable to swallow intact capsules, the capsules may be carefully opened and the contents added to a small amount of acidic soft food with a pH of 4.5 or less, such as applesauce, at room temperature. The CREON-soft food mixture should be swallowed immediately without crushing or chewing, and followed with water or juice to ensure complete ingestion. Care should be taken to ensure that no drug is retained in the mouth.

#### 2.2 Dosage

Dosage recommendations for pancreatic enzyme replacement therapy were published following the Cystic Fibrosis Foundation Consensus Conferences. CREON should be administered in a manner consistent with the recommendations of the Patients may be dosed on a fat ingestion-based or actual body weight-based dosing scheme. <sup>1, 2, 3</sup>Cystic Fibrosis Foundation Consensus Conferences (also known as Conferences) provided in the following paragraphs, except for infants. Although the Conferences recommend doses of 2,000 to 4,000 lipase units in infants up to 12 months, CREON is available in a 3,000 lipase unit capsule. Therefore, the recommended dose of CREON in infants up to 12 months is 3,000 lipase units per 120 mL of formula or per breast-feeding.

Additional recommendations for pancreatic enzyme therapy in patients with exocrine pancreatic insufficiency due to chronic pancreatitis or pancreatectomy are based on a clinical trial conducted in these populations.

##### Infants (up to 12 months)

CREON is available in the strength of 3,000 USP units of lipase thus infants may be given 3,000 lipase units (one capsule) per 120 mL of formula or per breast-feeding. Do not mix CREON capsule contents

directly into formula or breast milk prior to administration. [see Administration ( )] 2.1

#### Children Older than 12 Months and Younger than 4 Years

Enzyme dosing should begin with 1,000 lipase units/kg of body weight per meal for children less than age 4 years to a maximum of 2,500 lipase units/kg of body weight per meal (or less than or equal to 10,000 lipase units/kg of body weight per day), or less than 4,000 lipase units/g fat ingested per day.

#### Children 4 Years and Older and Adults

Enzyme dosing should begin with 500 lipase units/kg of body weight per meal for those older than age 4 years to a maximum of 2,500 lipase units/kg of body weight per meal (or less than or equal to 10,000 lipase units/kg of body weight per day), or less than 4,000 lipase units/g fat ingested per day.

Usually, half of the prescribed CREON dose for an individualized full meal should be given with each snack. The total daily dose should reflect approximately three meals plus two or three snacks per day.

Enzyme doses expressed as lipase units/kg of body weight per meal should be decreased in older patients because they weigh more but tend to ingest less fat per kilogram of body weight.

#### Adults with Exocrine Pancreatic Insufficiency Due to Chronic Pancreatitis or Pancreatectomy

The initial starting dose and increases in the dose per meal should be individualized based on clinical symptoms, the degree of steatorrhea present, and the fat content of the diet.

In one clinical trial, patients received CREON at a dose of 72,000 lipase units per meal while consuming at least 100 g of fat per day. Lower starting doses recommended in the literature are consistent with the 500 lipase units/kg of body weight per meal lowest starting dose recommended for adults in the Cystic Fibrosis Foundation Consensus Conferences Guidelines. Usually, half of the prescribed CREON dose for an individualized full meal should be given with each snack. [see Clinical Studies ( )] 14.2<sup>1, 2, 3, 4</sup>

#### Limitations on Dosing

Dosing should not exceed the recommended maximum dosage set forth by the Cystic Fibrosis Foundation Consensus Conferences Guidelines. If symptoms and signs of steatorrhea persist, the dosage may be increased by the healthcare professional. Patients should be instructed not to increase the dosage on their own. There is great inter-individual variation in response to enzymes; thus, a range of doses is recommended. Changes in dosage may require an adjustment period of several days. If doses are to exceed 2,500 lipase units/kg of body weight per meal, further investigation is warranted. Doses greater than 2,500 lipase units/kg of body weight per meal (or greater than 10,000 lipase units/kg of body weight per day) should be used with caution and only if they are documented to be effective by 3-day fecal fat measures that indicate a significantly improved coefficient of fat absorption. Doses greater than 6,000 lipase units/kg of body weight per meal have been associated with colonic stricture, indicative of fibrosing colonopathy, in children less than 12 years of age. Patients currently receiving higher doses than 6,000 lipase units/kg of body weight per meal should be examined and the dosage either immediately decreased or titrated downward to a lower range. <sup>1, 2, 3</sup>[see Warnings and Precautions ( )] 5.1

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

The active ingredient in CREON evaluated in clinical trials is lipase. CREON is dosed by lipase units.

Other active ingredients include protease and amylase. Each CREON delayed-release capsule strength contains the specified amounts of lipase, protease, and amylase as follows:

- 3,000 USP units of lipase; 9,500 USP units of protease; 15,000 USP units of amylase delayed-release capsules have a white opaque cap with imprint “CREON 1203” and a white opaque body.
- 6,000 USP units of lipase; 19,000 USP units of protease; 30,000 USP units of amylase delayed-release capsules have an orange opaque cap with imprint “CREON 1206” and a blue opaque body.

- 12,000 USP units of lipase; 38,000 USP units of protease; 60,000 USP units of amylase delayed-release capsules have a brown opaque cap with imprint “CREON 1212” and a colorless transparent body.
- 24,000 USP units of lipase; 76,000 USP units of protease; 120,000 USP units of amylase delayed-release capsules have an orange opaque cap with imprint “CREON 1224” and a colorless transparent body.

#### **4 CONTRAINDICATIONS**

None.

#### **5 WARNINGS AND PRECAUTIONS**

##### **5.1 Fibrosing Colonopathy**

Fibrosing colonopathy has been reported following treatment with different pancreatic enzyme products. Fibrosing colonopathy is a rare, serious adverse reaction initially described in association with high-dose pancreatic enzyme use, usually over a prolonged period of time and most commonly reported in pediatric patients with cystic fibrosis. The underlying mechanism of fibrosing colonopathy remains unknown. Doses of pancreatic enzyme products exceeding 6,000 lipase units/kg of body weight per meal have been associated with colonic stricture in children less than 12 years of age. Patients with fibrosing colonopathy should be closely monitored because some patients may be at risk of progressing to stricture formation. It is uncertain whether regression of fibrosing colonopathy occurs. It is generally recommended, unless clinically indicated, that enzyme doses should be less than 2,500 lipase units/kg of body weight per meal (or less than 10,000 lipase units/kg of body weight per day) or less than 4,000 lipase units/g fat ingested per day<sup>5, 611</sup> [see *Dosage and Administration ( )*]. 2.1

Doses greater than 2,500 lipase units/kg of body weight per meal (or greater than 10,000 lipase units/kg of body weight per day) should be used with caution and only if they are documented to be effective by 3-day fecal fat measures that indicate a significantly improved coefficient of fat absorption. Patients receiving higher doses than 6,000 lipase units/kg of body weight per meal should be examined and the dosage either immediately decreased or titrated downward to a lower range.

##### **5.2 Potential for Irritation to Oral Mucosa**

Care should be taken to ensure that no drug is retained in the mouth. CREON should not be crushed or chewed or mixed in foods having a pH greater than 4.5. These actions can disrupt the protective enteric coating resulting in early release of enzymes, irritation of oral mucosa, and/or loss of enzyme activity. For patients who are unable to swallow intact capsules, the capsules may be carefully opened and the contents added to a small amount of acidic soft food with a pH of 4.5 or less, such as applesauce, at room temperature. The CREON-soft food mixture should be swallowed immediately and followed with water or juice to ensure complete ingestion. [see *Dosage and Administration ( )* and *Patient Counseling Information ( )*] 2.217.1

##### **5.3 Potential for Risk of Hyperuricemia**

Caution should be exercised when prescribing CREON to patients with gout, renal impairment, or hyperuricemia. Porcine-derived pancreatic enzyme products contain purines that may increase blood uric acid levels.

##### **5.4 Potential Viral Exposure from the Product Source**

CREON is sourced from pancreatic tissue from swine used for food consumption. Although the risk that CREON will transmit an infectious agent to humans has been reduced by testing for certain viruses during manufacturing and by inactivating certain viruses during manufacturing, there is a theoretical risk for transmission of viral disease, including diseases caused by novel or unidentified viruses. Thus, the

presence of porcine viruses that might infect humans cannot be definitely excluded. However, no cases of transmission of an infectious illness associated with the use of porcine pancreatic extracts have been reported.

## 5.5 Allergic Reactions

Caution should be exercised when administering pancrelipase to a patient with a known allergy to proteins of porcine origin. Rarely, severe allergic reactions including anaphylaxis, asthma, hives, and pruritus, have been reported with other pancreatic enzyme products with different formulations of the same active ingredient (pancrelipase). The risks and benefits of continued CREON treatment in patients with severe allergy should be taken into consideration with the overall clinical needs of the patient.

## 6 ADVERSE REACTIONS

The most serious adverse reactions reported with different pancreatic enzyme products of the same active ingredient (pancrelipase) that are described elsewhere in the label include fibrosing colonopathy, hyperuricemia and allergic reactions . [see *Warnings and Precautions ( )*] 5

### 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 to the rates in the clinical trials of another drug and may not reflect the rates observed in practice.

The short-term safety of CREON was assessed in clinical trials conducted in 121 patients with exocrine pancreatic insufficiency (EPI): 67 patients with EPI due to cystic fibrosis (CF) and 25 patients with EPI due to chronic pancreatitis or pancreatectomy were treated with CREON.

#### Cystic Fibrosis

Studies 1 and 2 were randomized, double-blind, placebo-controlled, crossover studies of 49 patients, ages 7 to 43 years, with EPI due to CF. Study 1 included 32 patients ages 12 to 43 years and Study 2 included 17 patients ages 7 to 11 years. In these studies, patients were randomized to receive CREON at a dose of 4,000 lipase units/g fat ingested per day or matching placebo for 5 to 6 days of treatment, followed by crossover to the alternate treatment for an additional 5 to 6 days. The mean exposure to CREON during these studies was 5 days.

In Study 1, one patient experienced duodenitis and gastritis of moderate severity 16 days after completing treatment with CREON. Transient neutropenia without clinical sequelae was observed as an abnormal laboratory finding in one patient receiving CREON and a macrolide antibiotic.

In Study 2, adverse reactions that occurred in at least 2 patients (greater than or equal to 12%) treated with CREON were vomiting and headache. Vomiting occurred in 2 patients treated with CREON and did not occur in patients treated with placebo; headache occurred in 2 patients treated with CREON and did not occur in patients treated with placebo.

The most common adverse reactions (greater than or equal to 4%) in Studies 1 and 2 were vomiting, dizziness, and cough. enumerates adverse reactions that occurred in at least 2 patients (greater than or equal to 4%) treated with CREON at a higher rate than with placebo in Studies 1 and 2. Table 1

**Table 1: Adverse Reactions Occurring in at Least 2 Patients (greater than or equal to 4%) in Cystic Fibrosis (Studies 1 and 2)**

Adverse Reaction	CREON Capsules n = 49 (%)	Placebo n = 47 (%)
Vomiting	3 (6)	1 (2)
Dizziness	2 (4)	1 (2)

Cough	2 (4)	0
-------	-------	---

An additional open-label, single-arm study assessed the short-term safety and tolerability of CREON in 18 infants and children, ages 4 months to 6 years, with EPI due to cystic fibrosis. Patients received their usual pancreatic enzyme replacement therapy (mean dose of 7,000 lipase units/kg/day for a mean duration of 18.2 days) followed by CREON (mean dose of 7,500 lipase units/kg/day for a mean duration of 12.6 days). There were no serious adverse reactions. Adverse reactions that occurred in patients during treatment with CREON were vomiting, irritability, and decreased appetite, each occurring in 6% of patients.

#### Chronic Pancreatitis or Pancreatectomy

A randomized, double-blind, placebo-controlled, parallel group study was conducted in 54 adult patients, ages 32 to 75 years, with EPI due to chronic pancreatitis or pancreatectomy. Patients received single-blind placebo treatment during a 5-day run-in period followed by an intervening period of up to 16 days of investigator-directed treatment with no restrictions on pancreatic enzyme replacement therapy. Patients were then randomized to receive CREON or matching placebo for 7 days. The CREON dose was 72,000 lipase units per main meal (3 main meals) and 36,000 lipase units per snack (2 snacks). The mean exposure to CREON during this study was 6.8 days in the 25 patients that received CREON.

The most common adverse reactions reported during the study were related to glycemic control and were reported more commonly during CREON treatment than during placebo treatment.

enumerates adverse reactions that occurred in at least 1 patient (greater than or equal to 4%) treated with CREON at a higher rate than with placebo. Table 2

**Table 2: Adverse Reactions in at Least 1 Patient (greater than or equal to 4%) in the Chronic Pancreatitis or Pancreatectomy Trial**

Adverse Reaction	CREON Capsules n = 25 (%)	Placebo n = 29 (%)
Hyperglycemia	2 (8)	2 (7)
Hypoglycemia	1 (4)	1 (3)
Abdominal Pain	1 (4)	1 (3)
Abnormal Feces	1 (4)	0
Flatulence	1 (4)	0
Frequent Bowel Movements	1 (4)	0
Nasopharyngitis	1 (4)	0

## 6.2 Postmarketing Experience

Postmarketing data from this formulation of CREON have been available since 2009. The following adverse reactions have been identified during post approval use of this formulation of CREON. 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.

Gastrointestinal disorders (including abdominal pain, diarrhea, flatulence, constipation and nausea), skin disorders (including pruritus, urticaria and rash), blurred vision, myalgia, muscle spasm, and asymptomatic elevations of liver enzymes have been reported with this formulation of CREON.

Delayed- and immediate-release pancreatic enzyme products with different formulations of the same active ingredient (pancrelipase) have been used for the treatment of patients with exocrine pancreatic insufficiency due to cystic fibrosis and other conditions, such as chronic pancreatitis. The long-term safety profile of these products has been described in the medical literature. The most serious adverse reactions included fibrosing colonopathy, distal intestinal obstruction syndrome (DIOS), recurrence of

pre-existing carcinoma, and severe allergic reactions including anaphylaxis, asthma, hives, and pruritus.

## **7 DRUG INTERACTIONS**

No drug interactions have been identified. No formal interaction studies have been conducted.

## **8 USE IN SPECIFIC POPULATIONS**

### **8.1 Pregnancy**

Teratogenic effects

Pregnancy Category C: Animal reproduction studies have not been conducted with pancrelipase. It is also not known whether pancrelipase can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. CREON should be given to a pregnant woman only if clearly needed. The risk and benefit of pancrelipase should be considered in the context of the need to provide adequate nutritional support to a pregnant woman with exocrine pancreatic insufficiency. Adequate caloric intake during pregnancy is important for normal maternal weight gain and fetal growth. Reduced maternal weight gain and malnutrition can be associated with adverse pregnancy outcomes.

### **8.3 Nursing Mothers**

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when CREON is administered to a nursing woman. The risk and benefit of pancrelipase should be considered in the context of the need to provide adequate nutritional support to a nursing mother with exocrine pancreatic insufficiency.

### **8.4 Pediatric Use**

The short-term safety and effectiveness of CREON were assessed in two randomized, double-blind, placebo-controlled, crossover studies of 49 patients with EPI due to cystic fibrosis, 25 of whom were pediatric patients. Study 1 included 8 adolescents between 12 and 17 years of age. Study 2 included 17 children between 7 and 11 years of age. The safety and efficacy in pediatric patients in these studies were similar to adult patients . *[see Adverse Reactions ( ) and Clinical Studies ( )]* 6.114

An open-label, single-arm, short-term study of CREON was conducted in 18 infants and children, ages 4 months to six years of age, with EPI due to cystic fibrosis. Patients received their usual pancreatic enzyme replacement therapy (mean dose of 7,000 lipase units/kg/day for a mean duration of 18.2 days) followed by CREON (mean dose of 7,500 lipase units/kg/day for a mean duration of 12.6 days). The mean daily fat intake was 48 grams during treatment with usual pancreatic enzyme replacement therapy and 47 grams during treatment with CREON. When patients were switched from their usual pancreatic enzyme replacement therapy to CREON, they demonstrated similar spot fecal fat testing results; the clinical relevance of spot fecal fat testing has not been demonstrated. Adverse reactions that occurred in patients during treatment with CREON were vomiting, irritability, and decreased appetite . *[see Adverse Reactions ( )]* 6.1

The safety and efficacy of pancreatic enzyme products with different formulations of pancrelipase consisting of the same active ingredient (lipases, proteases, and amylases) for treatment of children with exocrine pancreatic insufficiency due to cystic fibrosis have been described in the medical literature and through clinical experience.

Dosing of pediatric patients should be in accordance with recommended guidance from the Cystic Fibrosis Foundation Consensus Conferences . Doses of other pancreatic enzyme products exceeding 6,000 lipase units/kg of body weight per meal have been associated with fibrosing colonopathy and colonic strictures in children less than 12 years of age . *[see Dosage and Administration ( )]* 2.1 *[see Warnings and Precautions ( )]* 5.1



## 8.5 Geriatric Use

Clinical studies of CREON did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger patients.

## 10 OVERDOSAGE

There have been no reports of overdose in clinical trials or postmarketing surveillance with this formulation of CREON. Chronic high doses of pancreatic enzyme products have been associated with fibrosing colonopathy and colonic strictures. High doses of pancreatic enzyme products have been associated with hyperuricosuria and hyperuricemia, and should be used with caution in patients with a history of hyperuricemia, gout, or renal impairment. [see Dosage and Administration ( ) and Warnings and Precautions ( )] 2.25.1 [see Warnings and Precautions ( )] 5.3

## 11 DESCRIPTION

CREON is a pancreatic enzyme preparation consisting of pancrelipase, an extract derived from porcine pancreatic glands. Pancrelipase contains multiple enzyme classes, including porcine-derived lipases, proteases, and amylases.

Pancrelipase is a beige-white amorphous powder. It is miscible in water and practically insoluble or insoluble in alcohol and ether.

Each delayed-release capsule for oral administration contains enteric-coated spheres (0.71–1.60 mm in diameter).

The active ingredient evaluated in clinical trials is lipase. CREON is dosed by lipase units.

Other active ingredients include protease and amylase.

CREON contains the following inactive ingredients: cetyl alcohol, dimethicone, hypromellose phthalate, polyethylene glycol, and triethyl citrate.

9,500 USP units of protease; 15,000 USP units of amylase delayed-release capsules have a white opaque cap with imprint “CREON 1203” and a white opaque body. The shells contain titanium dioxide and hypromellose. 3,000 USP units of lipase;

19,000 USP units of protease; 30,000 USP units of amylase delayed-release capsules have a Swedish-orange opaque cap with imprint “CREON 1206” and a blue opaque body. The shells contain FD&C Blue No. 2, gelatin, red iron oxide, sodium lauryl sulfate, titanium dioxide, and yellow iron oxide. 6,000 USP units of lipase;

38,000 USP units of protease; 60,000 USP units of amylase delayed-release capsules have a brown opaque cap with imprint “CREON 1212” and a colorless transparent body. The shells contain black iron oxide, gelatin, red iron oxide, sodium lauryl sulfate, titanium dioxide, and yellow iron oxide. 12,000 USP units of lipase;

76,000 USP units of protease; 120,000 USP units of amylase delayed-release capsules have a Swedish-orange opaque cap with imprint “CREON 1224” and a colorless transparent body. The shells contain gelatin, red iron oxide, sodium lauryl sulfate, titanium dioxide, and yellow iron oxide. 24,000 USP units of lipase;

## 12 CLINICAL PHARMACOLOGY

### 12.1 Mechanism of Action

The pancreatic enzymes in CREON catalyze the hydrolysis of fats to monoglyceride, glycerol and free fatty acids, proteins into peptides and amino acids, and starches into dextrans and short chain sugars such

as maltose and maltotriose in the duodenum and proximal small intestine, thereby acting like digestive enzymes physiologically secreted by the pancreas.

### **12.3 Pharmacokinetics**

The pancreatic enzymes in CREON are enteric-coated to minimize destruction or inactivation in gastric acid. CREON is designed to release most of the enzymes at an approximate pH of 5.5 or greater. Pancreatic enzymes are not absorbed from the gastrointestinal tract in appreciable amounts. *in vivo*

## **13 NONCLINICAL TOXICOLOGY**

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

Carcinogenicity, genetic toxicology, and animal fertility studies have not been performed with pancrelipase.

## **14 CLINICAL STUDIES**

The short-term efficacy of CREON was evaluated in three studies conducted in 103 patients with exocrine pancreatic insufficiency (EPI). Two studies were conducted in 49 patients with EPI due to cystic fibrosis (CF); one study was conducted in 54 patients with EPI due to chronic pancreatitis or pancreatectomy.

### **14.1 Cystic Fibrosis**

Studies 1 and 2 were randomized, double-blind, placebo-controlled, crossover studies in 49 patients, ages 7 to 43 years, with exocrine pancreatic insufficiency due to cystic fibrosis. Study 1 included patients aged 12 to 43 years (n = 32). The final analysis population was limited to 29 patients; 3 patients were excluded due to protocol deviations. Study 2 included patients aged 7 to 11 years (n = 17). The final analysis population was limited to 16 patients; 1 patient withdrew consent prior to stool collection during treatment with CREON. In each study, patients were randomized to receive CREON at a dose of 4,000 lipase units/g fat ingested per day or matching placebo for 5 to 6 days of treatment, followed by crossover to the alternate treatment for an additional 5 to 6 days. All patients consumed a high-fat diet (greater than or equal to 90 grams of fat per day, 40% of daily calories derived from fat) during the treatment periods.

The coefficient of fat absorption (CFA) was determined by a 72-hour stool collection during both treatments, when both fat excretion and fat ingestion were measured. Each patient's CFA during placebo treatment was used as their no-treatment CFA value.

In Study 1, mean CFA was 89% with CREON treatment compared to 49% with placebo treatment. The mean difference in CFA was 41 percentage points in favor of CREON treatment with 95% CI: (34, 47) and  $p < 0.001$ .

In Study 2, mean CFA was 83% with CREON treatment compared to 47% with placebo treatment. The mean difference in CFA was 35 percentage points in favor of CREON treatment with 95% CI: (27, 44) and  $p < 0.001$ .

Subgroup analyses of the CFA results in Studies 1 and 2 showed that mean change in CFA with CREON treatment was greater in patients with lower no-treatment (placebo) CFA values than in patients with higher no-treatment (placebo) CFA values. There were no differences in response to CREON by age or gender, with similar responses to CREON observed in male and female patients, and in younger (under 18 years of age) and older patients.

The coefficient of nitrogen absorption (CNA) was determined by a 72-hour stool collection during both treatments, when nitrogen excretion was measured and nitrogen ingestion from a controlled diet was estimated (based on the assumption that proteins contain 16% nitrogen). Each patient's CNA during

placebo treatment was used as their no-treatment CNA value.

In Study 1, mean CNA was 86% with CREON treatment compared to 49% with placebo treatment. The mean difference in CNA was 37 percentage points in favor of CREON treatment with 95% CI: (31, 42) and  $p < 0.001$ .

In Study 2, mean CNA was 80% with CREON treatment compared to 45% with placebo treatment. The mean difference in CNA was 35 percentage points in favor of CREON treatment with 95% CI: (26, 45) and  $p < 0.001$ .

## 14.2 Chronic Pancreatitis or Pancreatectomy

A randomized, double-blind, placebo-controlled, parallel group study was conducted in 54 adult patients, ages 32 to 75 years, with EPI due to chronic pancreatitis or pancreatectomy. The final analysis population was limited to 52 patients; 2 patients were excluded due to protocol violations. Ten patients had a history of pancreatectomy (7 were treated with CREON). In this study, patients received placebo for 5 days (run-in period), followed by pancreatic enzyme replacement therapy as directed by the investigator for 16 days; this was followed by randomization to CREON or matching placebo for 7 days of treatment (double-blind period). Only patients with CFA less than 80% in the run-in period were randomized to the double-blind period. The dose of CREON during the double-blind period was 72,000 lipase units per main meal (3 main meals) and 36,000 lipase units per snack (2 snacks). All patients consumed a high-fat diet (greater than or equal to 100 grams of fat per day) during the treatment period.

The CFA was determined by a 72-hour stool collection during the run-in and double-blind treatment periods, when both fat excretion and fat ingestion were measured. The mean change in CFA from the run-in period to the end of the double-blind period in the CREON and Placebo groups is shown in Table 3

**Table 3: Change in CFA in the Chronic Pancreatitis and Pancreatectomy Trial (Run-in Period to End of Double-Blind Period)**

	<b>CREON n = 24</b>	<b>Placebo n = 28</b>
<b>CFA [%]</b>		
Run-in Period (Mean, SD)	54 (19)	57 (21)
End of Double-Blind Period (Mean, SD)	86 (6)	66 (20)
<b>Change in CFA * [%]</b>		
Run-in Period to End of Double-Blind Period (Mean, SD)	32 (18)	9 (13)
Treatment Difference (95% CI)	21 (14, 28)	

\* $p < 0.0001$

Subgroup analyses of the CFA results showed that mean change in CFA was greater in patients with lower run-in period CFA values than in patients with higher run-in period CFA values. Only 1 of the patients with a history of total pancreatectomy was treated with CREON in the study. That patient had a CFA of 26% during the run-in period and a CFA of 73% at the end of the double-blind period. The remaining 6 patients with a history of partial pancreatectomy treated with CREON on the study had a mean CFA of 42% during the run-in period and a mean CFA of 84% at the end of the double-blind period.

## 15 REFERENCES

Borowitz DS, Grand RJ, Durie PR, et al. Use of pancreatic enzyme supplements for patients with cystic fibrosis in the context of fibrosing colonopathy. 1995; 127: 681-684. <sup>1</sup>*Journal of Pediatrics*.

Borowitz DS, Baker RD, Stallings V. Consensus report on nutrition for pediatric patients with cystic fibrosis. 2002 Sep; 35: 246-259. <sup>2</sup>*Journal of Pediatric Gastroenterology Nutrition*.

Stallings VA, Stark LJ, Robinson KA, et al. Evidence-based practice recommendations for nutrition-related management of children and adults with cystic fibrosis and pancreatic insufficiency: results of a systematic review. . 2008; 108: 832-839. <sup>3</sup>*Journal of the American Dietetic Association*

Dominguez-Munoz JE. Pancreatic enzyme therapy for pancreatic exocrine insufficiency. 2007; 9: 116-122. <sup>4</sup>*Current Gastroenterology Reports*.

Smyth RL, Ashby D, O'Hea U, et al. Fibrosing colonopathy in cystic fibrosis: results of a case-control study. 1995; 346: 1247-1251. <sup>5</sup>*Lancet*.

FitzSimmons SC, Burkhardt GA, Borowitz DS, et al. High-dose pancreatic-enzyme supplements and fibrosing colonopathy in children with cystic fibrosis. 1997; 336: 1283-1289. <sup>6</sup>*New England Journal of Medicine*.

## **17 PATIENT COUNSELING INFORMATION**

See FDA-approved patient labeling (Medication Guide)

### **17.1 Dosing and Administration**

- Instruct patients and caregivers that CREON should only be taken as directed by their healthcare professional. Patients should be advised that the total daily dose should not exceed 10,000 lipase units/kg body weight/day unless clinically indicated. This needs to be especially emphasized for patients eating multiple snacks and meals per day. Patients should be informed that if a dose is missed, the next dose should be taken with the next meal or snack as directed. Doses should not be doubled . [see *Dosage and Administration ( )*] 2
- Instruct patients and caregivers that CREON should always be taken with food. Patients should be advised that CREON delayed-release capsules and the capsule contents must not be crushed or chewed as doing so could cause early release of enzymes and/or loss of enzymatic activity. Patients should swallow the intact capsules with adequate amounts of liquid at mealtimes. If necessary, the capsule contents can also be sprinkled on soft acidic foods . [see *Dosage and Administration ( )*] 2

### **17.2 Fibrosing Colonopathy**

Advise patients and caregivers to follow dosing instructions carefully, as doses of pancreatic enzyme products exceeding 6,000 lipase units/kg of body weight per meal have been associated with colonic strictures in children below the age of 12 years . [see *Dosage and Administration ( )*] 2

### **17.3 Allergic Reactions**

Advise patients and caregivers to contact their healthcare professional immediately if allergic reactions to CREON develop . [see *Warnings and Precautions ( )*] 5.5

### **17.4 Pregnancy and Breast Feeding**

- Instruct patients to notify their healthcare professional if they are pregnant or are thinking of becoming pregnant during treatment with CREON . [see *Use in Specific Populations ( )*] 8.1
- Instruct patients to notify their healthcare professional if they are breast feeding or are thinking of breast feeding during treatment with CREON . [see *Use in Specific Populations ( )*] 8.3

Manufactured by:

- Abbott Products GmbH
- Hannover, Germany

Marketed By:

- Abbott Laboratories

- North Chicago, IL 60064, U.S.A.

1055216 12E Rev Jul 2011

© 2011 Abbott Laboratories

## **MEDICATION GUIDE**

**CREON®(krē 'ŏn)**

**(pancrelipase)**

### **Delayed-Release Capsules**

Read this Medication Guide before you start taking CREON and each time you get a refill. There may be new information. This information does not take the place of talking to your doctor about your medical condition or treatment.

### **What is the most important information I should know about CREON?**

CREON may increase your chance of having a rare bowel disorder called fibrosing colonopathy. This condition is serious and may require surgery. The risk of having this condition may be reduced by following the dosing instructions that your doctor gave you. **Call your doctor right away if you have any unusual or severe:**

- stomach area (abdominal) pain
- bloating
- trouble passing stool (having bowel movements)
- nausea, vomiting, or diarrhea

Take CREON exactly as prescribed. Do not take more or less CREON than directed by your doctor.

### **What is CREON?**

CREON is a prescription medicine used to treat people who cannot digest food normally because their pancreas does not make enough enzymes due to cystic fibrosis, swelling of the pancreas that lasts a long time (chronic pancreatitis), removal of some or all of the pancreas (pancreatectomy), or other conditions. CREON may help your body use fats, proteins, and sugars from food.

CREON contains a mixture of digestive enzymes including lipases, proteases, and amylases from pig pancreas.

### **What should I tell my doctor before taking CREON?**

**Before taking CREON, tell your doctor about all your medical conditions, including if you:**

- are allergic to pork (pig) products
- have a history of intestinal blockage of your intestines, or scarring or thickening of your bowel wall (fibrosing colonopathy)
- have gout, kidney disease, or high blood uric acid (hyperuricemia)
- have trouble swallowing capsules
- have any other medical condition
- are pregnant or plan to become pregnant. It is not known if CREON will harm your unborn baby.
- are breast-feeding or plan to breast-feed. It is not known if CREON passes into your breast milk.

including prescription and nonprescription medicines, vitamins, and herbal supplements. **Tell your doctor about all the medicines you take,**

Know the medicines you take. Keep a list of them and show it to your doctor and pharmacist when you get a new medicine.

### **How should I take CREON?**

- **Take CREON exactly as your doctor tells you.**

- You should not switch CREON with any other pancreatic enzyme product without first talking to your doctor.
- Do not take more capsules in a day than the number your doctor tells you to take (total daily dose).
- Always take CREON with a meal or snack and enough liquid to swallow CREON completely. If you eat a lot of meals or snacks in a day, be careful not to go over your total daily dose.
- Your doctor may change your dose based on the amount of fatty foods you eat or based on your weight.
- Crushing, chewing or holding the CREON capsules in your mouth may cause irritation in your mouth or change the way CREON works in your body. **Do not crush or chew CREON capsules or its contents, and do not hold the capsule or capsule contents in your mouth.**

### **Giving CREON to infants (children up to 12 months)**

1. Give CREON right before each feeding of formula or breast milk.
2. Do not mix CREON capsule contents directly into formula or breast milk.
3. Open the capsules and sprinkle the contents directly into your infant's mouth or mix the contents in a small amount of room temperature acidic soft food such as applesauce. These foods should be the kind found in baby food jars that you buy at the store, or other food recommended by your doctor.
4. If you sprinkle the CREON on food, give the CREON and food mixture to your child right away. Do not store CREON that is mixed with food.
5. Give your child enough liquid to completely swallow the CREON contents or the CREON and food mixture.
6. Look in your child's mouth to make sure that all of the medicine has been swallowed.

### **Giving CREON to children and adults**

1. Swallow CREON capsules whole and take them with enough liquid to swallow them right away.
2. If you have trouble swallowing capsules, open the capsules and sprinkle the contents on a small amount of room temperature acidic food such as applesauce. Ask your doctor about other foods you can mix with CREON.
3. If you sprinkle CREON on food, swallow it right after you mix it and drink enough water or juice to make sure the medicine is swallowed completely. Do not store CREON that is mixed with food.
4. If you forget to take CREON, call your doctor or wait until your next meal and take your usual number of capsules. Take your next dose at your usual time. **Do not make up for missed doses.**

### **What are the possible side effects of CREON?**

#### **CREON may cause serious side effects, including:**

- See “ ” **What is the most important information I should know about CREON?**
- This can happen if CREON is not swallowed completely. **Irritation of the inside of your mouth.**
- **Increase in blood uric acid levels. This may cause worsening of swollen, painful joints (gout) caused by an increase in your blood uric acid levels.**
- **Allergic reactions, including trouble with breathing, skin rashes, or swollen lips.**

Call your doctor right away if you have any of these symptoms.

#### **The most common side effects of CREON include:**

- Blood sugar increase (hyperglycemia) or decrease (hypoglycemia)
- Pain in your stomach (abdominal area)
- Frequent or abnormal bowel movements
- Gas
- Vomiting
- Dizziness
- Sore throat and cough

## Other Possible Side Effects:

CREON and other pancreatic enzyme products are made from the pancreas of pigs, the same pigs people eat as pork. These pigs may carry viruses. Although it has never been reported, it may be possible for a person to get a viral infection from taking pancreatic enzyme products that come from pigs.

Tell your doctor if you have any side effect that bothers you or that does not go away.

These are not all the side effects of CREON. For more information, ask your doctor or pharmacist.

Call your doctor for medical advice about side effects. You may report side effects to the FDA at 1-800-FDA-1088.

You may also report side effects to Abbott Laboratories at 1-800-241-1643.

## How should I store CREON?

- Store CREON at room temperature below 77°F (25°C). Avoid heat.
- You may store CREON at a temperature between 77°F to 104°F (25°C to 40°C) for up to 30 days. Throw away any CREON stored at these temperatures for more than 30 days.
- Keep CREON in a dry place and in the original container.
- After opening the bottle, keep it closed tightly between uses to protect from moisture.

## Keep CREON and all medicines out of the reach of children.

### General information about CREON

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use CREON for a condition for which it was not prescribed. Do not give CREON to other people to take, even if they have the same symptoms you have. It may harm them.

This Medication Guide summarizes the most important information about CREON. If you would like more information, talk to your doctor. You can ask your doctor or pharmacist for information about CREON that is written for healthcare professionals. For more information, go to [www.creon-us.com](http://www.creon-us.com) or call toll-free [1-800-241-1643].

## What are the ingredients in CREON?

lipase, protease, amylase **Active Ingredient:**

cetyl alcohol, dimethicone, hypromellose phthalate, polyethylene glycol, and triethyl citrate. **Inactive Ingredients:**

The shells of the CREON 6,000 USP units of lipase, 12,000 USP units of lipase, and 24,000 USP units of lipase strengths contain: gelatin, red iron oxide, sodium lauryl sulfate, titanium dioxide, and yellow iron oxide.

In addition:

The shells for the CREON 3,000 USP units of lipase contain titanium dioxide and hypromellose.

The shells of the 6,000 USP units of lipase strength capsules contain FD&C Blue No. 2.

The shells of the 12,000 USP units of lipase strength capsules contain black iron oxide.

**This Medication Guide has been approved by the U.S. Food and Drug Administration.**

Manufactured for:

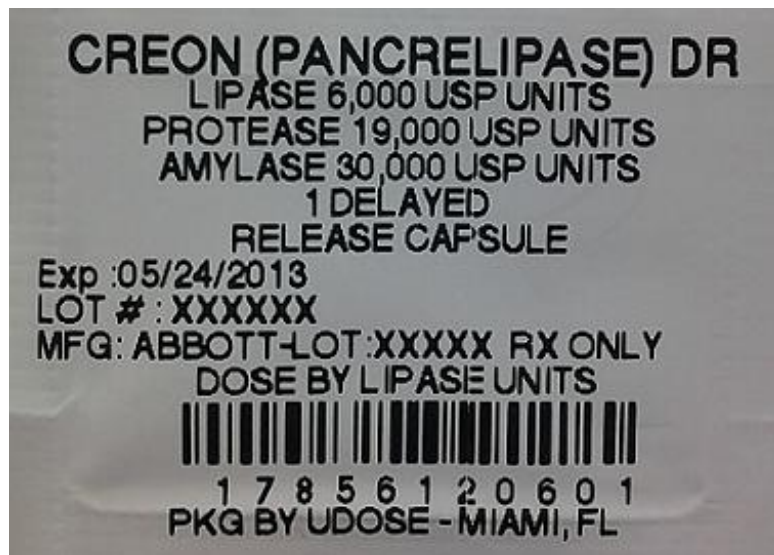
Abbott Laboratories      North Chicago, IL 60064, U.S.A.

1055216 12E Rev Jul 2011

© 2011 Abbott Laboratories

Rev July/2011

**CREON (PANCRELIPASE) CAPSULE, DELAYED RELEASE PELLETS CREON (PANCRELIPASE) CAPSULE, DELAYED RELEASE**



**CREON**

pancrelipase capsule, delayed release pellets

**Product Information**

<b>Product Type</b>	HUMAN PRESCRIPTION DRUG	<b>Item Code (Source)</b>	NDC:17856-1206(NDC:0032-1206)
<b>Route of Administration</b>	ORAL		

**Active Ingredient/Active Moiety**

Ingredient Name	Basis of Strength	Strength
PANCRELIPASE LIPASE (UNII: 8MYC33932O) (PANCRELIPASE LIPASE - UNII:8MYC33932O)	PANCRELIPASE LIPASE	6000 [USP'U]
PANCRELIPASE PROTEASE (UNII: 3560D81V50) (PANCRELIPASE PROTEASE - UNII:3560D81V50)	PANCRELIPASE PROTEASE	19000 [USP'U]
PANCRELIPASE AMYLASE (UNII: YOJ58O116E) (PANCRELIPASE AMYLASE - UNII:YOJ58O116E)	PANCRELIPASE AMYLASE	30000 [USP'U]

**Inactive Ingredients**

Ingredient Name	Strength
cetyl alcohol (UNII: 936JST6JCN)	
dimethicone (UNII: 92RU3N3Y1O)	
POLYETHYLENE GLYCOLS (UNII: 3WJQ0SDW1A)	
triethyl citrate (UNII: 8Z96QXD6UM)	
hypromelloses (UNII: 3NXW29V3WO)	



**Product Characteristics**

<b>Color</b>	ORANGE (Orange) , BLUE (Blue)	<b>Score</b>	no score
<b>Shape</b>	OVAL (OVAL)	<b>Size</b>	14mm
<b>Flavor</b>		<b>Imprint Code</b>	CREON;1206
<b>Contains</b>			

**Packaging**

#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:17856-1206-1	1 in 1 POUCH		

**Marketing Information**

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
NDA	NDA020725	08/13/2010	

**Labeler** - Atlantic Biologicals Corps (047437707)**Registrant** - Atlantic Biologicals Corps (047437707)**Establishment**

Name	Address	ID/FEI	Business Operations
Atlantic Biologicals Corps		047437707	RELABEL, REPACK

Revised: 1/2012

Atlantic Biologicals Corps