

## PRODUCT MONOGRAPH

**PrSANDOSTATIN®**

(Octreotide acetate Injection)

50 µg/ mL, 100 µg/ mL, 200 µg/ mL, 500 µg/ mL

**PrSANDOSTATIN® LAR®**

Octreotide (as acetate) for Injectable Suspension

10, 20 or 30 mg octreotide (as acetate) per vial

### SYNTHETIC OCTAPEPTIDE ANALOGUE OF SOMATOSTATIN

Novartis Pharmaceuticals Canada Inc.  
Dorval, Quebec  
H9S 1A9

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**PrSANDOSTATIN®**

(Octreotide acetate Injection)

**PrSANDOSTATIN® LAR®**

Octreotide (as acetate) for Injectable Suspension

**PART I: HEALTH PROFESSIONAL INFORMATION**

**SUMMARY PRODUCT INFORMATION**

<b>Route of Administration</b>	<b>Dosage Form / Strength</b>	<b>Clinically Relevant Nonmedicinal Ingredients</b>
<b>SANDOSTATIN®:</b> Subcutaneous and intravenous infusion	<b>SANDOSTATIN:</b> Solution in ampoules (1 mL): 50µg/mL, 100 µg/mL, 500 µg/mL or Multidose Vials (5 mL): 200 µg/ mL	<b>SANDOSTATIN:</b> lactic acid, phenol and mannitol
<b>SANDOSTATIN® LAR®:</b> Intramuscular	<b>SANDOSTATIN LAR:</b> Powder for slow release suspension: 10, 20 or 30 mg octreotide per glass vial (6 mL)  Single dose glass vial (6 mL)	<b>SANDOSTATIN LAR:</b> Poly (DL-lactide-co-glycolide), carboxymethylcellulose sodium, mannitol, and poloxamer 188  <i>For a complete listing see Dosage Forms, Composition and Packaging section.</i>

**INDICATIONS AND CLINICAL USE**

**SANDOSTATIN s.c. Ampoules and Multidose vials**

**General**

SANDOSTATIN (octreotide acetate) therapy is indicated for control of symptoms in patients with metastatic carcinoid and vasoactive intestinal peptide-secreting tumors (VIPomas) as well as in patients with acromegaly.

Data are insufficient to determine whether SANDOSTATIN decreases the size, rate of growth,

or development of metastases in patients with these tumors.

SANDOSTATIN is also indicated for the prevention of complications following pancreatic surgery in patients undergoing high risk procedures.

SANDOSTATIN is also indicated for the emergency management of bleeding gastro-oesophageal varices in patients with cirrhosis and as protection from rebleeding. SANDOSTATIN is used in association with specific intervention such as endoscopic sclerotherapy.

### **Carcinoid Tumors**

SANDOSTATIN is indicated for the symptomatic treatment of metastatic carcinoid tumors where it suppresses or inhibits the severe diarrhea and flushing episodes associated with the disease.

### **Vasoactive Intestinal Peptide Tumors (VIPomas)**

SANDOSTATIN is indicated for the treatment of the profuse watery diarrhea associated with VIP-secreting tumors. Significant improvement has been noted in the overall condition of these otherwise therapeutically unresponsive patients. Therapy with SANDOSTATIN results in improvement in electrolyte abnormalities, e.g., hypokalemia, often enabling reduction of fluid and electrolyte support.

### **Acromegaly**

SANDOSTATIN is indicated to reduce blood levels of growth hormone and IGF-1 (somatomedin C) including acromegalic patients who have had inadequate response to, or cannot be treated with surgical resection, pituitary irradiation and/or bromocriptine mesylate at maximally tolerated doses.

Since the effects of pituitary irradiation may not become maximal for several years, adjunctive therapy with SANDOSTATIN to reduce blood levels of GH and IGF-1 offers potential benefit before the effects of irradiation are manifested.

A clinically relevant growth hormone (GH) reduction (by 50% or more) occurs in almost all patients, and normalisation (plasma GH < 5 µg/L) can be achieved in about half of the cases.

In most patients, SANDOSTATIN markedly reduces the clinical symptoms of the disease such as headache, skin and soft tissue swelling, hyperhidrosis, arthralgia, paresthesia. In patients with a large pituitary adenoma, SANDOSTATIN treatment may result in some shrinkage of the tumour mass.

### **Prevention of Complications following Pancreatic Surgery**

SANDOSTATIN inhibits basal and stimulated exocrine pancreatic secretion and when administered peri- and post-operatively in patients undergoing high risk pancreatic surgery,

reduces the incidence and severity of typical post-operative complications (e.g. pancreatic fistula, abscess and subsequent sepsis and post-operative acute pancreatitis).

### **Bleeding Gastro-oesophageal Varices**

In patients presenting with bleeding gastro-oesophageal varices due to underlying cirrhosis, SANDOSTATIN administration in combination with specific intervention (e.g. sclerotherapy) provides better control of bleeding and early rebleeding, reduces transfusion requirements and improves 5-day survival).

### **SANDOSTATIN LAR (Octreotide [as acetate] for Injectable Suspension)**

#### **Acromegaly**

SANDOSTATIN LAR is indicated for acromegalic patients who are adequately controlled with SANDOSTATIN administered subcutaneously, including those in whom surgery, radiotherapy or dopamine agonist treatment is inappropriate or ineffective, or in the interim period until radiotherapy becomes fully effective (see DOSAGE AND ADMINISTRATION).

In most patients, SANDOSTATIN LAR markedly reduces the clinical symptoms of the disease, such as headache, perspiration, paresthesia, fatigue, osteoarthralgia and carpal tunnel syndrome.

#### **Carcinoid Tumors**

SANDOSTATIN LAR is indicated for the treatment of the severe diarrhea and flushing episodes associated with carcinoid tumors in patients in whom symptoms are adequately controlled on s.c. treatment with SANDOSTATIN.

#### **Vasoactive Intestinal Peptide Tumors (VIPomas)**

SANDOSTATIN LAR is indicated for the treatment of the profuse watery diarrhea associated with VIP-secreting tumors in patients in whom symptoms are adequately controlled on s.c. treatment with SANDOSTATIN.

In patients with carcinoid syndrome and VIPomas, the effect of SANDOSTATIN LAR on tumor size and rate of growth has not been determined. In patients with carcinoid syndrome and VIPomas, the effect of SANDOSTATIN LAR on development of metastases has not been determined.

### **CONTRAINDICATIONS**

SANDOSTATIN and SANDOSTATIN LAR (octreotide acetate) are contraindicated in patients with a known hypersensitivity to octreotide or to any of the excipients.

## **WARNINGS AND PRECAUTIONS**

### **General**

Sudden escape from symptomatic control by SANDOSTATIN (octreotide acetate) may occur infrequently, with rapid recurrence of severe symptoms. Dosage adjustment therefore may be required.

As GH-secreting pituitary tumours may sometimes expand, causing serious complications (e.g. visual field defects), it is essential that all patients treated with SANDOSTATIN s.c. or SANDOSTATIN LAR be carefully monitored. If evidence of tumour expansion appears, alternative procedures may be advisable.

Octreotide alters the balance between the counter-regulatory hormones, insulin, glucagon and growth hormone, which may result in hypoglycemia or hyperglycemia. Octreotide also suppresses secretion of thyroid stimulating hormone, which may result in hypothyroidism. Cardiac conduction abnormalities have also occurred during treatment with octreotide.

### **Carcinogenesis and Mutagenesis**

Studies in laboratory animals have demonstrated no mutagenic potential of octreotide acetate. No long-term studies in animals to assess carcinogenicity have been completed. SANDOSTATIN s.c. did not impair fertility in rats at doses up to 1000 µg/kg/day.

### **Cardiovascular**

In both acromegalic and carcinoid syndrome patients, bradycardia, arrhythmias and conduction abnormalities have been reported during octreotide therapy. Dose adjustments of drugs such as beta-blockers, calcium channel blockers, or agents to control fluid and electrolyte balance, may be necessary. Other EKG changes were observed such as QT prolongation, axis shifts, early repolarization, low voltage, R/S transition, early R wave progression, and non-specific ST-T wave changes. The relationship of these events to octreotide acetate is not established because many of these patients have underlying cardiac disease (see WARNINGS AND PRECAUTIONS). In one acromegalic patient with severe congestive heart failure, initiation of SANDOSTATIN Injection therapy resulted in worsening of CHF with improvement when drug was discontinued. Confirmation of a drug effect was obtained with a positive rechallenge (see ADVERSE REACTIONS).

### **Endocrine and Metabolism**

#### **Glucose Metabolism**

SANDOSTATIN therapy is occasionally associated with mild transient hypo- or hyperglycemia but may also result in overt diabetes due to alterations in the balance between the counter-regulatory hormones, insulin, glucagon and growth hormone. Patients should be closely

observed on introduction of SANDOSTATIN therapy and at each change of dosage for symptomatic evidence of hyper- and hypoglycemia. Insulin requirement of patients with type I diabetes mellitus may be reduced by administration of SANDOSTATIN. In non-diabetics and type II diabetics with partially intact insulin reserves, SANDOSTATIN administration can result in prandial increases in glycemia. Severe hyperglycemia, subsequent pneumonia, and death following initiation of SANDOSTATIN (octreotide acetate) Injection therapy was reported in one patient with no history of hyperglycemia.

Predicting the effect of SANDOSTATIN on glucose tolerance in any given patients is not possible at this time. It is recommended that all acromegalic patients have their serum glucose carefully monitored during initiation and titration of therapy with SANDOSTATIN s.c. or SANDOSTATIN LAR.

Since following bleeding episodes from esophageal varices, there is an increased risk for the development of insulin-dependent diabetes or for changes in insulin requirement in patients with pre-existing diabetes, an appropriate monitoring of blood glucose is required.

It is therefore recommended that glucose tolerance and antidiabetic treatment be periodically monitored during therapy with SANDOSTATIN s.c. or SANDOSTATIN LAR.

### **Thyroid function**

Data on the effect of chronic therapy with SANDOSTATIN on hypothalamic/pituitary function have not been obtained. A progressive drop in T<sub>4</sub> levels has been reported, culminating in clinical and biochemical hypothyroidism after 19 months of therapy in one clinical trial patient (carcinoid) receiving 1500 µg of SANDOSTATIN s.c. daily. Minimal impairment of thyroid function was recorded in some acromegalic patients following treatment with SANDOSTATIN LAR. Therefore, baseline and periodic assessment of thyroid function (TSH, total and/or free T<sub>4</sub>) should be monitored during chronic therapy with octreotide acetate.

### **Gastrointestinal**

#### **Nutrition**

There is evidence that SANDOSTATIN therapy may alter absorption of dietary fats in some patients. It is suggested that periodic quantitative 72-hour fecal fat and serum carotene determinations be performed to aid in the assessment of possible drug-induced aggravation of fat malabsorption.

Depressed vitamin B12 levels and abnormal Schilling's tests have been observed in some patients receiving octreotide therapy, and monitoring of vitamin B12 levels is recommended during therapy with SANDOSTATIN LAR (octreotide acetate for injectable suspension).

Octreotide has been investigated for the reduction of excessive fluid loss from the G.I. tract in patients with conditions producing such a loss. If such patients are receiving total parenteral nutrition (TPN), serum zinc may rise excessively when the fluid loss is reversed. Patients on TPN and octreotide should have periodic monitoring of zinc levels.

## **Hepatic/Biliary/Pancreatic**

### **Gallbladder and Related Events**

Single doses of SANDOSTATIN Injection have been shown to inhibit gallbladder contractility and decrease bile secretion in normal volunteers. In clinical trials with SANDOSTATIN Injection (primarily patients with acromegaly or psoriasis) in patients who had not previously received octreotide, the incidence of biliary tract abnormalities was 63% (27% gallstones, 24% sludge without stones, 12% biliary duct dilatation). The incidence of stones or sludge in patients who received SANDOSTATIN Injection for 12 months or longer was 52%. The incidence of gallbladder abnormalities did not appear to be related to age, sex or dose but was related to duration of exposure.

In clinical trials 52% of acromegalic patients, most of whom received SANDOSTATIN LAR for 12 months or longer, developed new biliary abnormalities including gallstones, microlithiasis, sediment, sludge and dilatation. The incidence of new cholelithiasis was 22%, of which 7% were microstones.

In clinical trials 62% of malignant carcinoid patients who received SANDOSTATIN LAR for up to 18 months developed new biliary abnormalities including gallstones, sludge and dilatation. New gallstones occurred in a total of 24% of patients.

Across all trials, a few patients developed acute cholecystitis, ascending cholangitis, biliary obstruction, cholestatic hepatitis, or pancreatitis during octreotide therapy or following its withdrawal. One patient developed ascending cholangitis during SANDOSTATIN Injection therapy and died. Despite the high incidence of new gallstones in patients receiving octreotide, 1% of patients developed acute symptoms requiring cholecystectomy.

It is recommended that patients on extended therapy with SANDOSTATIN or SANDOSTATIN LAR be evaluated at baseline and periodically (at about 6-month intervals) to assess the presence of gallstones using ultrasound evaluations of the gallbladder and bile ducts (see Monitoring and Laboratory Tests).

### **Liver Impairment**

In patients with liver cirrhosis, the half-life of the drug may be increased, necessitating adjustment of the maintenance dosage.

### **Patient Information**

Careful instruction in sterile subcutaneous and intramuscular injection techniques should be given to the patients and to other persons who may administer SANDOSTATIN or SANDOSTATIN LAR injections (see CONSUMER INFORMATION).

Patients with carcinoid tumors and VIPomas should be advised to adhere closely to their scheduled return visits for reinjection in order to minimize exacerbation of symptoms.



Patients with acromegaly should also be urged to adhere to their return visit schedule to help assure steady control of GH and IGF-1 levels.

## **Renal**

### **Renal Impairment**

In patients with severe renal failure requiring dialysis, the half-life of the drug may be increased, necessitating adjustment of the maintenance dosage.

## **Sexual Function/Reproduction**

The therapeutic benefits of a reduction in growth hormone (GH) levels and normalization of insulin-like growth factor 1 (IGF-1) concentration in female acromegalic patients could potentially restore fertility. Pregnancy in acromegalic patients may increase the risk of gestational diabetes, hypertension and exacerbation of the underlying cardiac disease, therefore female patients of childbearing potential should be advised to use adequate contraception during treatment with octreotide.

## **Special Populations**

**Pregnant Women:** There are no adequate and well-controlled studies in pregnant women. In the post-marketing experience, data on a limited number of pregnancies have been reported in patients on octreotide therapy.

**Nursing Women:** It is not known whether octreotide is excreted in human breast milk. Animal studies have shown excretion of octreotide in breast milk. Patients should not breast-feed during SANDOSTATIN treatment.

**Pediatrics:** Experience with SANDOSTATIN s.c. and SANDOSTATIN LAR in the pediatric population is limited.

SANDOSTATIN Injection has been primarily used in patients with congenital hyperinsulinism (also called nesidioblastosis). The youngest patient to receive the drug was 1 month old. At doses of 1-40 µg/kg body weight/day, the majority of side effects observed were gastrointestinal—steatorrhea, diarrhea, vomiting and abdominal distension. Poor growth has been reported in several patients treated with SANDOSTATIN Injection for more than 1 year; catch-up growth occurred after SANDOSTATIN Injection was discontinued. A 16-month-old male with enterocutaneous fistula developed sudden abdominal pain and increased nasogastric drainage and died 8 hours after receiving a single 100 µg subcutaneous dose of SANDOSTATIN Injection.

## **Monitoring and Laboratory Tests**

Laboratory tests that may be helpful as biochemical markers in determining and following patient response depend on the specific tumor. Based on diagnosis, measurement of the following substances may be useful in monitoring the progress of therapy:

Carcinoid: 5-HIAA (urinary 5-hydroxyindole acetic acid), plasma serotonin, plasma Substance P

VIPoma: VIP (plasma vasoactive intestinal peptide)

Acromegaly: Growth hormone - IGF-1 (somatomedin C).

Responsiveness to octreotide may be evaluated by determining growth hormone levels at 1-4 hour intervals for 8-12 hours after subcutaneous injection of SANDOSTATIN Injection (not SANDOSTATIN LAR). Alternatively, a single measurement of IGF-1 (somatomedin C) level may be made two weeks after initiation of SANDOSTATIN Injection or dosage change. After patients are switched from SANDOSTATIN Injection to SANDOSTATIN LAR, GH and IGF-1 determinations may be made after 3 monthly injections of SANDOSTATIN LAR. (Steady-state serum levels of octreotide are reached only after a period of 3 months of monthly injections.) Growth hormone can be determined using the mean of 4 assays taken at 1 hour intervals. Somatomedin C can be determined with a single assay. All GH and IGF-1 determinations should be made 4 weeks after the previous SANDOSTATIN LAR.

In patients with acromegaly, if no relevant reduction of GH and IGF 1 levels and no improvement of clinical symptoms have been achieved within 3 months of starting treatment with SANDOSTATIN, therapy should be discontinued.

Patients should undergo a baseline ultrasound examination of the gallbladder and bile ducts prior to commencing SANDOSTATIN treatment. Periodic ultrasound examination of the gallbladder should be performed, at about 6-month intervals, throughout SANDOSTATIN treatment. If stones are already present before the start of therapy, the potential benefit of SANDOSTATIN should be assessed against the potential risks associated with the gallstones. In case of asymptomatic gallstone, SANDOSTATIN may be continued, depending on re-assessment of the benefit/risk ratio with increased frequency of monitoring. Symptomatic gallstones should receive medical attention and be treated.

Baseline and periodic total and/or free T<sub>4</sub> measurements should be performed during chronic therapy (see WARNINGS AND PRECAUTIONS).

## **ADVERSE REACTIONS**

### **Adverse Drug Reaction Overview**

The most frequent adverse reactions reported with SANDOSTATIN (octreotide as acetate) and SANDOSTATIN LAR (octreotide as acetate) include gastrointestinal disorders, nervous system disorders, hepatobiliary disorders, and metabolism and nutritional disorders.

### **Clinical Trial Adverse Drug Reactions**

*Because clinical trials are conducted under very specific conditions the adverse reaction rates observed in the clinical trials may not reflect the rates observed in practice and should not be compared to the rates in the clinical trials of another drug. Adverse drug reaction information from clinical trials is useful for identifying drug-related adverse*

events and for approximating rates.

**SANDOSTATIN s.c. ampoules and Multidose Vials in GEP and Acromegaly:**

**Table 1 - Composite Listing of Adverse Reactions in 196 GEP Endocrine Tumor Patients and 114 Acromegalic Patients Treated with SANDOSTATIN**

<b>Adverse Reaction Profile According to Body System</b>	<b>GEP Endocrine Tumor Patients (n=196) %</b>	<b>Acromegalic Patients (n=114) %</b>
<u>Gastrointestinal S.</u>		
Diarrhea	6.6	57.9
Abdominal discomfort	4.1	43.9
Stools Loose	3.1	36.0
Nausea	8.7	29.8
Flatulence	0.5	13.2
Constipation	1.0	8.8
Abdominal distention	-	7.9
Stools abnormal	0.5	6.1
Cholelithiasis	<1.0	4.4
Rectal gas	-	4.4
Vomiting	2.6	4.4
Fatty stools	3.6	-
GI bleeding	0.5	-
Rectal disorders	0.5	-
Hemorrhoids	-	1.8
Cholecystitis	-	1.8
Eructations	-	1.8
<u>Integumentary S.</u>		
Pain at injection site	8.2	9.6
Acne	-	4.4
Bruise	0.5	4.4
Pruritus	-	4.4
Alopecia/Baldness/Hair loss	1.0	3.5
<u>Musculoskeletal S.</u>		
Backache/pain	0.5	4.4
Joint pain	-	4.4
Arthritis	-	2.6
Arm/leg heavy - tired	-	2.6
Leg ache/pain	-	2.6
Osteoarthritis	-	1.8
Vertebral disk disorder	-	1.8
Twitching	-	1.8
<u>Respiratory S.</u>		
Throat pain	0.5	2.6
Flu symptoms	-	6.1
Cold symptoms	-	6.1
Sinusitis	-	3.5
Nasal congestion	-	1.8

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<u>Cardiovascular S.</u>		
Leg cramps	-	3.5
Dyspnea	-	1.8
Epistaxis	-	1.8
Chest pain	0.5	-
Edema	1.0	2.6
Ischemic Attack	0.5	-
Hypertension	0.5	-
Thrombophlebitis	0.5	-
Cramps	-	2.6
<u>Autonomic S.</u>		
Visual disturbances	0.5	2.6
Mouth dry/furry/xerostomia	0.5	1.8
Flushing	0.5	1.8
Numbness	-	1.8
Hot flash	-	1.8
<u>Central Nervous S.</u>		
Headache	1.5	18.4
Dizziness	1.5	14.9
Fatigue	1.0	9.6
Anxiety/Nervousness	0.5	2.6
Asthenia	0.5	-
Bell's palsy	0.5	-
Seizure	0.5	-
Depression	0.5	2.6
Sleepiness/insomnia	0.5	1.8
Weakness	1.0	-
Moody	-	2.6
Appetite loss	-	1.8
Irritability	-	1.8
Tinnitus	-	1.8
<u>Urogenital S.</u>		
Urinary tract infection	-	6.1
Pollakiuria	-	3.5
Vagina infection	-	2.6
Vagina itch	-	1.8
Breast lump	-	1.8
Dysuria	-	1.8
Kidneys, pain in	-	1.8
Polyuria	-	1.8
Prostatitis	-	1.8
Tumor breast	-	1.8
<u>Hematologic</u>		
Hematoma, injection site	-	9.6

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<u>Endocrine S.</u>		
Hypoadrenalism	-	2.6
Hypothyroidism	-	1.8
Hypogonadism	-	1.8
Hypoglycemia	-	1.8
<u>Miscellaneous</u>		
Foot pain	-	1.8
Fever	-	1.8
Otitis	-	1.8
Weight gain	-	1.8

Local reactions after s.c. administration of SANDOSTATIN include pain and sensations of stinging, tingling or burning at the site of injection, with redness and swelling. These rarely last more than fifteen minutes. Local discomfort may be reduced by allowing the solution to reach room temperature before injection and by slowly injecting SANDOSTATIN.

In clinical trials, acromegalic patients had a higher incidence of diarrhea, abdominal pain/discomfort, nausea and loose stools than patients treated with SANDOSTATIN s.c. for other indications. It is believed that the primary reason for this observation is that patients who received SANDOSTATIN s.c. for carcinoid syndrome, VIPoma and other gastroenteropancreatic tumors had these gastrointestinal symptoms at baseline and would only report them as adverse events if they became more frequent or severe during SANDOSTATIN s.c. treatment.

The adverse event rate for SANDOSTATIN during study B301 is presented in comparison to placebo. This comparison more accurately reflects the difference in adverse event rates between SANDOSTATIN and placebo.

**Table 2 - Number % Patients in US Studies B301, B302, B303 with Adverse Events by Treatment and by Body System. Events occurring in  $\geq 3\%$**

<b>Specific Adverse Event by Body System</b>	<b>Placebo B301 (n=55)%</b>	<b>SANDOSTATIN B301 (n=60)%</b>	<b>SANDOSTATIN B301, B302 &amp; B303 (n=114)%</b>
<b>Skin</b>			
Pain at injection site	2 (3.6)	5 (8.3)	11 (9.6)
Acne	--	2 (3.3)	5 (4.4)
Bruise	1 (1.1)	2 (3.3)	5 (4.4)
Pruritus	--	--	5 (4.4)
Alopecia/Baldness/Hair loss	--	--	4 (3.5)
<b>Musculoskeletal</b>			
Back ache/pain	--	--	5 (4.4)
Joint pain	2 (3.6)	1 (1.7)	5 (4.4)

**Table 2 - Number % Patients in US Studies B301, B302, B303 with Adverse Events by Treatment and by Body System. Events occurring in  $\geq 3\%$**

<b>Specific Adverse Event by Body System</b>	<b>Placebo B301 (n=55)%</b>	<b>SANDOSTATIN B301 (n=60)%</b>	<b>SANDOSTATIN B301, B302 &amp; B303 (n=114)%</b>
<b>Respiratory</b>			
Flu symptoms	--	2 (3.3)	7 (6.1)
Cold symptoms	--	2 (3.3)	7 (6.1)
Sinusitis	--	--	4 (3.5)
<b>Cardiovascular</b>			
Leg cramps	--	--	4 (3.5)
<b>Hematologic</b>			
Hematoma, injection site	6 (10.9)	1 (1.7)	11 (9.6)
<b>Gastrointestinal</b>			
Diarrhea	6 (10.9)	32 (53.3)	66 (57.9)
Abdominal discomfort	7 (12.7)	14 (23.3)	50 (43.9)
Stools Loose	8 (14.5)	16 (26.7)	41 (36.0)
Nausea	6 (10.9)	17 (28.3)	34 (29.8)
Flatulence	2 (3.6)	6 (10.0)	15 (13.2)
Constipation	--	1 (1.7)	10 (8.8)
Abdominal distention	--	2 (3.3)	9 (7.9)
Stools abnormal	--	3 (5.0)	7 (6.1)
Cholelithiasis	--	--	5 (4.4)
Rectal gas	--	--	5 (4.4)
Vomiting	1 (1.8)	3 (5.0)	5 (4.4)
<b>Urogenital</b>			
Urinary tract infection	--	3 (5.0)	7 (6.1)
Pollakiuria	2 (3.6)	1 (1.7)	4 (3.5)
<b>Central Nervous</b>			
Headache	6 (10.9)	8 (13.3)	21 (18.4)
Dizziness	6 (10.9)	5 (8.3)	17 (14.9)
Fatigue	2 (3.6)	3 (5.0)	11 (9.6)

Gastrointestinal side effects include anorexia, nausea, vomiting, crampy abdominal pain, abdominal bloating, flatulence, loose stools, diarrhea and steatorrhea. Although measured fecal fat excretion may increase, there is no evidence to date that long-term treatment with SANDOSTATIN s.c. has led to nutritional deficiency due to malabsorption. In rare instances, gastrointestinal side effects may resemble acute intestinal obstruction with progressive abdominal distention, severe epigastric pain, abdominal tenderness and guarding. Occurrence of gastrointestinal side effects may be reduced by avoiding meals around the time of SANDOSTATIN s.c. administration, that is, by timing injections between meals or at bedtime.

**SANDOSTATIN s.c. ampoules and Multidose Vials in the Prevention of Complications Following Pancreatic surgery**

Local reactions at the site of injection were the most frequently reported side effects in 247 patients undergoing pancreatic surgery treated with SANDOSTATIN s.c. for 7 consecutive days starting on the day of the operation, at least 1 hour before laparotomy. Pruritus, exanthema, vomiting, biliary sludge and fever were each reported in 0.4 % of patients and flushes and rash occurred in 0.8% of patients.

**SANDOSTATIN Ampoules and Multidose Vials in Bleeding Gastro-oesophageal Varices**

Raised blood glucose levels were reported in 23 of 98 cirrhotic patients treated with SANDOSTATIN 25 µg/hour administered by i.v. infusion over 5 days for the emergency management of bleeding oesophageal varices. Diarrhea occurred in 5% of patients.

**SANDOSTATIN LAR (Octreotide for Injectable Suspension) in Acromegaly**

No clinical studies have been performed which compare SANDOSTATIN LAR to placebo. However, the profile of adverse reactions recorded in acromegalic patients treated with SANDOSTATIN LAR was similar to that known for SANDOSTATIN s.c., administration. Local injection site reactions to SANDOSTATIN may occur and are usually mild and of short duration. These reactions include pain, and rarely swelling and rash. In the double blind studies, gastrointestinal side effects following administration of SANDOSTATIN LAR were the most frequent adverse events and included abdominal pain, diarrhea (loose stools), flatulence and steatorrheic stools.

Adverse events occurring in  $\geq 2\%$  of patients who participated in the major studies in acromegaly (including their long-term extensions of up to 30 months duration) are listed in the table below, by dose group. It should be noted that some patients may appear under multiple dose levels since some patients switched dose levels.

**Table 3 - Adverse Events occurring in  $\geq 2\%$  of patients treated with SANDOSTATIN LAR**

Adverse Event	Dose Level		
	10mg n=57 (%)	20 mg n=233 (%)	30 mg n=129 (%)
<b>Application Site</b>			
Injection site pain	1.8	9.0	10.9
Injection site reaction	--	2.1	3.9
<b>Body as a whole</b>			
Influenza-like symptoms	8.8	10.3	17.8
Fatigue	3.5	5.2	11.6
Pain	1.8	5.6	2.3
Surgery	3.5	2.1	6.2
Back pain	1.8	3.4	2.3
Asthenia	3.5	1.3	4.7
Edema	1.8	3.0	1.6
Malaise	1.8	1.3	3.9
Accidental trauma	3.5	1.3	2.3
Hot flushes	--	2.6	1.6
Tumor nos.	--	0.9	3.1
Fever	--	0.9	3.1
<b>Cardiovascular</b>			
Hypertension	1.8	9.9	7

**Table 3 - Adverse Events occurring in  $\geq 2\%$  of patients treated with SANDOSTATIN LAR**

Adverse Event	Dose Level		
	10mg n=57 (%)	20 mg n=233 (%)	30 mg n=129 (%)
<b>CNS &amp; Peripheral</b>			
Headache	7.0	8.6	12.4
Dizziness	5.3	6.0	10.1
Paresthesia	1.8	3.4	7.0
Cramps	1.8	3.4	3.9
Vertigo	3.5	1.7	1.6
<b>Gastrointestinal</b>			
Diarrhea	7.0	21.5	30.2
Abdominal Pain	12.3	15.0	25.6
Flatulence	12.3	12.4	23.3
Constipation	14.0	8.2	14.7
Nausea	3.5	4.3	7.8
Vomiting	1.8	3.0	6.2
Dyspepsia	1.8	3.0	3.9
Steatorrhea	5.3	1.3	4.7
Feces discoloured	--	2.6	3.9
Tenesmus	--	0.9	3.9
<b>Liver &amp; Biliary</b>			
Cholelithiasis	3.5	7.3	12.4
Gall bladder disorder	--	3.9	7.0
<b>Musculoskeletal</b>			
Arthralgia	--	2.6	6.2
Arthropathy	--	3.0	4.7
Myalgia	1.8	2.1	3.9
Back pain	--	3.0	0.8
Pain leg(s)	3.5	0.9	0.8
<b>Psychiatric Disorder</b>			
Insomnia	3.5	3.9	1.6
Anxiety	--	1.3	4.7
Depression	--	2.1	1.6
Somnolence	1.8	0.4	2.3
Nervousness	--	0.4	2.3
<b>Resistance mechanism</b>			
Infection viral	1.8	2.6	3.9
abscess	--	2.1	1.6
Infection	1.8	1.7	2.3
<b>Respiratory System</b>			
URTI	3.5	3.4	4.7
Coughing	1.8	4.3	3.1
Pharyngitis	1.8	4.3	3.1
Rhinitis	--	--	5.4
Bronchitis	1.8	3.0	1.6
Respiratory disorder	1.8	1.3	3.1
Sinusitis	1.8	0.9	2.3
<b>Urinary System</b>			
UTI	1.8	2.1	3.1
Cystitis	--	0.9	2.3
Dysuria	--	0.4	2.3
Micturition frequency	--	--	2.3



**Table 3 - Adverse Events occurring in  $\geq 2\%$  of patients treated with SANDOSTATIN LAR**

Adverse Event	Dose Level		
	10mg n=57 (%)	20 mg n=233 (%)	30 mg n=129 (%)
<b>Skin &amp; Appendages</b>			
Sweating increased	1.8	3.4	4.7
Pruritus	1.8	1.3	4.7
Alopecia	1.8	0.9	3.9
Rash erythematous	--	2.6	0.8
Rash	3.5	--	--
<b>Other</b>			
Anemia	5.3	6.4	17.1
Conjunctivitis	--	2.1	3.1
Ear disorder	--	--	2.3
Menstrual disorder	--	1.3	2.3
Neoplasm, surgery	--	--	2.3

**Other adverse events (regardless of relationship) occurring at a  $1\% \geq$  incidence  $<2\%$  reported in the major studies in acromegaly (all doses combined):**

**Body As a Whole:** Edema peripheral, syncope

**Cardiovascular:** Hypertension aggravated

**Central and Peripheral Nervous Systems:** Cramps, vertigo, neuralgia, cramps legs, neuropathy, hyperkinesia

**Endocrine:** Growth hormone overproduction, hypothyroidism, goiter

**Gastro-intestinal System:** Gastritis, hemorrhoids, gastroenteritis, hemorrhage rectum, hernia, eructation, gastro-intestinal disorder, stomatitis ulcerative

**Hearing and Vestibular:** Deafness, ear discharge

**Heart Rate and Rhythm:** Tachycardia

**Liver and Biliary:** Hepatitis, liver fatty

**Metabolic and Nutritional:** Weight increase, hypoglycemia

**Musculo-skeletal System:** Arthrosis, surgery, bone fracture, osteonecrosis

**Platelet, Bleeding and Clotting:** Epistaxis

**Psychiatric:** Amnesia, sleep disorder

**Red Blood Cell:** Anemia hypochromic

**Reproductive Disorders: Female:** Breast pain female, intermenstrual bleeding, lactation non purperal. **Male:** prostate disorder

**Resistance Mechanism:** Moniliasis, otitis media, pharyngitis, tonsillitis, herpes simplex, herpes zoster

**Respiratory System:** Dyspnea, pneumonia

**Skin and Appendages:** Skin disorder, skin dry, acne, nail disorder

**Urinary System:** Urinary tract infection, cystitis, dysuria, micturition frequency

**Vascular (Extracardiac):** Phlebitis, cerebrovascular, vein varicose

### **Carcinoid Tumours**

No clinical studies have been performed which compare SANDOSTATIN LAR to placebo. However, the profile of adverse reactions recorded in patients with carcinoid tumours treated with SANDOSTATIN LAR was similar to that known for SANDOSTATIN s.c. administration. In a 6-month study during which patients with carcinoid tumours were treated with either SANDOSTATIN LAR i.m. at 4-week intervals or SANDOSTATIN s.c. t.i.d., gastrointestinal side effects were the most frequently reported adverse events in both groups and included abdominal pain, diarrhea (loose stools), constipation, flatulence nausea and vomiting. The incidences of these adverse events were similar between the 10, 20 and 30 mg dosages of SANDOSTATIN LAR.

Local injection site reactions to SANDOSTATIN may occur and are usually mild and of short duration. These reactions include pain, and rarely swelling and rash.

### **Descriptions of Selected Adverse Reactions**

#### **Liver and Biliary**

SANDOSTATIN and other somatostatin analogues have been shown to inhibit gallbladder contractility and decrease bile secretion, which can ~~may~~ lead to gallbladder abnormalities or sludge. Prolonged use of SANDOSTATIN s.c. or SANDOSTATIN LAR may result in gallstone formation (see WARNINGS AND PRECAUTIONS). Pancreatitis may develop in patients on long-term treatment with SANDOSTATIN who develop cholelithiasis.

There have been isolated reports of hepatic dysfunctions associated with SANDOSTATIN s.c. and SANDOSTATIN LAR administration. These consist of the following:

- acute hepatitis without cholestasis and normalization of transaminase values on withdrawal of SANDOSTATIN s.c. has occurred;
- the slow development of hyperbilirubinemia in association with elevation of alkaline phosphatase, gamma glutamyl transferase and, to a lesser extent, transaminases.

#### **Endocrine**

Because of its inhibitory action on growth hormone, glucagon and insulin, SANDOSTATIN s.c. or SANDOSTATIN LAR may impair glucose regulation. Postprandial glucose tolerance may be impaired and in some instances, with chronic administration, a state of persistent hyperglycemia may be induced. Hypoglycemia has also been observed.

**Pancreatitis**

Acute pancreatitis has been reported in rare instances. Generally, this effect is seen within the first hours or days of SANDOSTATIN s.c. treatment and resolves on withdrawal of the drug.

**Hypersensitivity and anaphylactic reactions**

Hypersensitivity reactions have been reported; most hypersensitivity and allergic reactions affect the skin and rarely affect the mouth and airways.

Isolated reports of anaphylactic reaction have been reported. SANDOSTATIN administered s.c. and to a much lesser degree by i.v. infusion, can lead to hypersensitivity reaction that may range from generalized pruritus to cardiovascular shock or bronchospasm, with one case of death having been reported.

**Cardiac disorder**

Isolated reports of bradycardia have been reported. In patients who are predisposed by having relatively low pre-treatment heart rates or whose cardiovascular system is already compromised, as in cirrhotic patients with bleeding esophageal varices, it is of importance that physicians be alerted to the possible undesirable effect of bradycardia. Tachycardia has also been observed.

**Other**

Rarely, hair loss has been reported in patients receiving SANDOSTATIN s.c. and SANDOSTATIN LAR treatment.

Rarely, dehydration has been reported.

**Post-Market Adverse Drug Reactions**

Spontaneously reported adverse drug reactions are presented below. Because these events are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or clearly establish a causal relationship to SANDOSTATIN or SANDOSTATIN LAR exposure.

<i>Cardiac disorders</i>	Arrhythmias
<i>Blood and lymphatic system disorders</i>	Thrombocytopenia*
<i>Gastrointestinal motility disorder</i>	Ileus, intestinal obstruction
<i>Hepato-biliary disorders</i>	Acute pancreatitis, acute hepatitis without cholestasis, cholestatic hepatitis, cholestasis, jaundice, cholestatic jaundice
<i>Hypersensitivity</i>	Anaphylaxis, allergy/hypersensitivity reactions
<i>Investigations</i>	Increased alkaline phosphatase levels, increased gamma glutamyl transferase level
<i>Skin and subcutaneous tissue disorders</i>	Urticaria

\*Most reports of thrombocytopenia were in patients with liver cirrhosis treated with SANDOSTATIN (i.v.) and some reports were with SANDOSTATIN LAR. This was reversible.

## **DRUG INTERACTIONS**

### **Drug-Drug Interactions**

Many patients with carcinoid syndrome or VIPomas being treated with SANDOSTATIN s.c. have also been, or are being, treated with many other drugs to control the symptomatology or progression of the disease, generally without serious drug interaction. Included are chemotherapeutic agents, H<sub>2</sub> antagonists, antimotility agents, drugs affecting glycemic states, solutions for electrolyte and fluid support or hyperalimentation, antihypertensive diuretics and anti-diarrheal agents.

Where symptoms are severe and SANDOSTATIN therapy is added to other therapies used to control glycemic states, such as sulfonylureas, insulin and diazoxide, to beta blockers, calcium channel blockers or to agents for the control of fluid and electrolyte balance, patients must be monitored closely and adjustment made in the other therapies as the symptoms of the disease are controlled. Evidence currently available suggests these imbalances in fluid and electrolytes or glycemic states are secondary to correction of pre-existing abnormalities and not to a direct metabolic action of SANDOSTATIN. Adjustment of the dosage of drugs, such as insulin, affecting glucose metabolism may be required following initiation of SANDOSTATIN therapy in patients with diabetes.

Since SANDOSTATIN has been associated with alterations in nutrient absorption, its effect on absorption of any orally administered drugs should be carefully considered. A single case of transplant rejection episode (renal/whole pancreas) in a patient immunosuppressed with cyclosporine has been reported. SANDOSTATIN treatment to reduce exocrine secretion and close a fistula in this patient resulted in decreases in blood levels of cyclosporine and may have contributed to the rejection episode. SANDOSTATIN has also been found to delay the intestinal absorption of cyclosporine or cimetidine.

Concomitant administration of octreotide and bromocriptine increases the bioavailability of bromocriptine.

Limited published data indicate that somatostatin analogs might decrease the metabolic clearance of compounds known to be metabolized by cytochrome P450 enzymes, which may be due to the suppression of growth hormone. Since it cannot be excluded that octreotide may have this effect, other drugs mainly metabolized by the CYP 3A4 and which have a low therapeutic index should therefore be used with caution (e.g. terfenadine, quinidine).

### **Drug-Food Interactions**

Interactions with food have not been established.

### **Drug-Herb Interactions**

Interactions with herbal products have not been established.

### **Drug-Laboratory Interactions**

No known interference exists with clinical laboratory tests, including amine or peptide determinations.

## **DOSAGE AND ADMINISTRATION**

### **Dosing Considerations**

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration. Do not use if particulates and/or discoloration are observed.

### **Recommended Dose and Dosage Adjustment**

#### **SANDOSTATIN s.c. Ampoules and Multidose Vials**

Subcutaneous injection is the recommended route of administration of SANDOSTATIN (octreotide acetate) for control of symptoms in most instances. Intravenous bolus injections have been used under emergency conditions. Multiple injections at the same site within short periods of time should be avoided. The initial dosage is 50 µg, administered subcutaneously, once or twice daily. Thereafter, the number of injections and dosage may be increased gradually based on patient tolerability, clinical response and effects on levels of tumour-produced hormones (in cases of carcinoid tumours on the urinary excretion of 5-hydroxyindole-acetic acid). Dosage information for patients with specific tumors is listed below. The drug is usually given in a b.i.d or t.i.d schedule.

#### **Carcinoid Tumors**

The suggested daily dosage of SANDOSTATIN during the first two weeks of therapy ranges from 100 to 600 µg per day in two to four divided doses (mean daily dosage is 300 µg). In the clinical studies, the median daily maintenance dosage was approximately 450 µg, but clinical and biochemical benefits were obtained in some patients with as little as 50 µg, while others required doses up to 1500 µg per day. However, experience with doses above 750 µg per day is limited.

#### **VIPomas**

Daily dosages of 200 to 300 µg in two to four divided doses are recommended during the initial 2 weeks of therapy (range 150 to 750 µg) to control symptoms of the disease. On an individual basis, dosage may be adjusted to achieve a therapeutic response, but usually doses above 450 µg per day are not required.

#### **Acromegaly**

Daily dosages of 100 µg to 300 µg b.i.d. or t.i.d. are recommended at the beginning of treatment. Dosage adjustment should be based on monthly assessment of GH levels, insulin-like growth factor 1 (IGF 1) / somatomedin C concentrations and clinical symptoms, and on tolerability. In

most patients, the optimal daily dose will be 200 to 300 µg per day. A maximum dose of 1500 µg should not be exceeded.

If no relevant reduction of GH and IGF 1 levels and no improvement of clinical symptoms have been achieved within 3 months of starting treatment with SANDOSTATIN, therapy should be discontinued (See Monitoring and Laboratory Tests).

### **Prevention of Complications following Pancreatic Surgery**

Daily dosage of 100 µg t.i.d., administered subcutaneously, for 7 consecutive days starting on the day of the operation at least one hour before laparotomy.

### **Bleeding Gastro-oesophageal Varices in patients with cirrhosis**

The recommended dose of SANDOSTATIN is 25 µg/hour by continuous i.v. infusion for 48 hours. In patients with high risk of rebleeding, infusion should be maintained up to a maximum of 5 days.

Immediately prior to use, the contents of the ampoule or multidose vial should be diluted in physiological saline. The volume of dilution will depend on the infusion system used and should be adjusted to ensure a continuous infusion of SANDOSTATIN at the recommended rate. Once diluted, the solution should be used within 24 hours. Discard unused portion.

As with all parenteral drugs, i.v. admixtures should be inspected visually for clarity, particulate matter, precipitation, discoloration and leakage prior to administration, whenever solution and container permit.

### **SANDOSTATIN LAR (Octreotide For Injectable Suspension)**

SANDOSTATIN LAR may only be administered by deep intragluteal injection. The site of repeat intragluteal injection should be alternated between the left and right gluteal muscle.

SANDOSTATIN LAR (octreotide acetate for injectable suspension) should only be administered by a trained health care professional. **Do not directly inject diluent without preparing suspension.** It is important to closely follow the mixing instructions included in the packaging. SANDOSTATIN LAR must be administered immediately after mixing. SANDOSTATIN LAR should be administered intragluteally at 4-week intervals. Administration of SANDOSTATIN LAR at intervals greater than 4 weeks is not recommended because there is no adequate information on whether such patients could be satisfactorily controlled. Deltoid injections are to be avoided because of significant discomfort at the injection site when given in that area. **SANDOSTATIN LAR should never be administered by the IV or S.C. routes.** The following dosage regimens are recommended.

### **Acromegaly**

For patients who are adequately controlled with SANDOSTATIN s.c., it is recommended to start treatment with the administration of 20 mg SANDOSTATIN LAR at 4-week intervals for 3 months. Treatment with SANDOSTATIN LAR can be started the day after the last dose of s.c. SANDOSTATIN. Subsequent dosage adjustments should be based upon serum growth hormone

(GH) and insulin-like growth factor 1/somatomedin C (IGF 1) concentrations and clinical symptoms.

For patients in whom, within this 3-month period, clinical symptoms and biochemical parameters (GH, IGF 1) are not fully controlled (GH concentrations still above 2.5 µg/L) the dose may be increased to 30 mg every four weeks.

For patients whose serum GH concentrations are consistently below 1 µg/L, whose IGF 1 serum concentrations normalized, and in whom most reversible signs/symptoms of acromegaly have disappeared after 3 months of treatment with 20 mg, 10 mg SANDOSTATIN LAR may be administered every 4 weeks. However, particularly in this group of patients, it is recommended to closely monitor adequate control of serum GH and IGF 1 concentrations and clinical signs/symptoms at this low dose of SANDOSTATIN LAR.

For patients in whom surgery, radiotherapy or dopamine agonist treatment is inappropriate, or in the interim period until radiotherapy becomes fully effective, a short test dosing of SANDOSTATIN s.c. is recommended to assess the response and systemic tolerability of octreotide prior to initiating treatment with SANDOSTATIN LAR as described above.

### **Carcinoid tumours and VIPomas**

Patients not currently treated with SANDOSTATIN s.c. should begin therapy with SANDOSTATIN s.c. The suggested daily dose during the first 2 weeks of therapy ranges from 100-600 µg/day in 2-4 divided doses (mean daily dose is 300 µg). Some patients may require doses up to 1500 µg/day. The suggested daily dose for VIPomas is 200-300 µg in 2-4 divided doses (range 150-750 µg); dosage may be adjusted on an individual basis to control symptoms but usually doses above 450 µg/day are not required.

SANDOSTATIN s.c. should be continued for at least 2 weeks. Thereafter, patients who are considered “responders” to octreotide acetate and who tolerate the drug may be switched to SANDOSTATIN LAR in the dosage regimen described below.

Patients currently receiving SANDOSTATIN s.c. can be switched to SANDOSTATIN LAR in a dosage of 20 mg i.m. intragluteally at 4-week intervals for 2 months. Gluteal injection sites should be alternated to avoid irritation. Because of the need for serum octreotide to reach therapeutically effective levels following initial injection of SANDOSTATIN LAR, carcinoid tumor and VIPoma patients should continue to receive SANDOSTATIN s.c. for at least 2 weeks in the same dosage they were taking before the switch. Failure to continue s.c. injections for this period may result in exacerbation of symptoms. Some patients may require 3 or 4 weeks of such therapy.

After 2 months of a 20 mg dosage of SANDOSTATIN LAR, dosage may be increased to 30 mg every 4 weeks if symptoms are not adequately controlled. Patients who achieve good control on a 20 mg dose may have their dose lowered to 10 mg for a trial period. If symptoms recur, dosage should then be increased to 20 mg every 4 weeks. A dose of 10 mg is not recommended as a starting dose, however, because therapeutically effective levels of octreotide are reached more rapidly with a 20 mg dose.

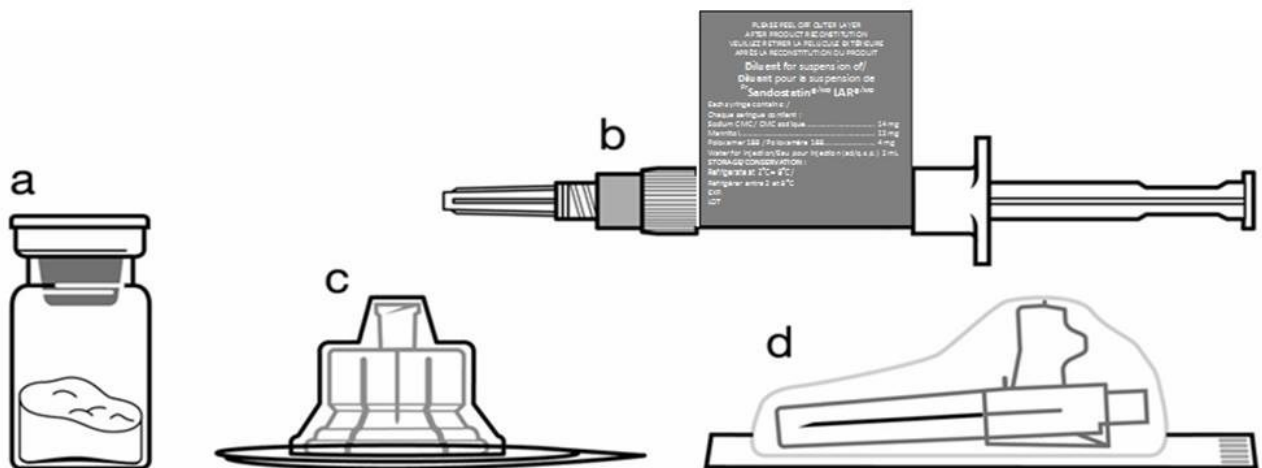
Dosages higher than 30 mg are not recommended because there is no information on their usefulness.

Despite good overall control of symptoms, patients with carcinoid tumors and VIPomas often experience periodic exacerbation of symptoms (regardless of whether they are being maintained on SANDOSTATIN s.c. or SANDOSTATIN LAR). During these periods they may be given SANDOSTATIN s.c. for a few days at the dosage they were receiving prior to switch to SANDOSTATIN LAR. When symptoms are again controlled, SANDOSTATIN s.c. can be discontinued.

## Administration

### **Preparation of SANDOSTATIN LAR (Octreotide [as acetate] for Injectable Suspension):**

SANDOSTATIN LAR is supplied in kits containing:



- a. One vial of SANDOSTATIN LAR 10 mg, 20 mg or 30 mg octreotide [as acetate] for injectable suspension
- b. One prefilled syringe containing the diluent (showing the peel-off outer syringe label)
- c. One vial adapter for drug product reconstitution
- d. One 19G x 1.5” safety injection needle
- e. One instruction booklet
- f. The package insert

Follow the instructions below carefully to ensure proper reconstitution of SANDOSTATIN LAR before deep intragluteal injection.

There are 3 critical steps in the reconstitution of SANDOSTATIN LAR. **Not following them could result in failure to deliver the drug appropriately.**



- **The kit must reach room temperature.** Remove the kit from the fridge and let the kit stand at room temperature for a minimum of 30 minutes before reconstitution, but do not exceed 24 hours.
- After adding the diluent, **ensure that the powder is fully saturated** by letting the vial stand for 5 minutes.
- After saturation, **shake the vial moderately** in a horizontal direction for a minimum of 30 seconds **until a uniform suspension is formed.** The SANDOSTATIN LAR suspension must only be prepared **immediately** before administration. As with all parenteral admixtures, the constituted product should be examined for the presence of foreign particulate matter, agglomeration or discolouration. Any defective units should be discarded.

SANDOSTATIN LAR should only be administered by a trained health care professional.



### Step 1

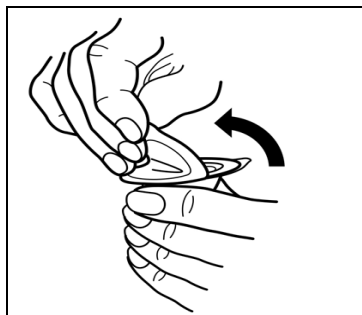
Remove the SANDOSTATIN LAR kit from refrigerated storage.

**ATTENTION:** It is essential to start the reconstitution process only after the kit reaches room temperature. Let the kit stand at room temperature for a minimum of 30 minutes before reconstitution, but do not exceed 24 hours.

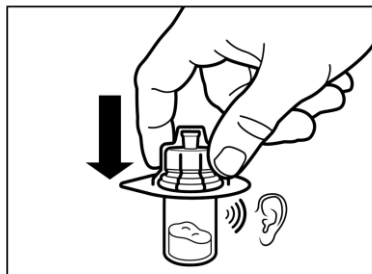


### Step 2

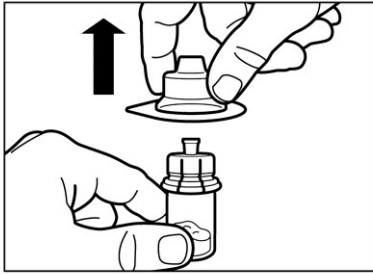
Remove the plastic cap from the vial and clean the rubber stopper of the vial with an alcohol wipe.



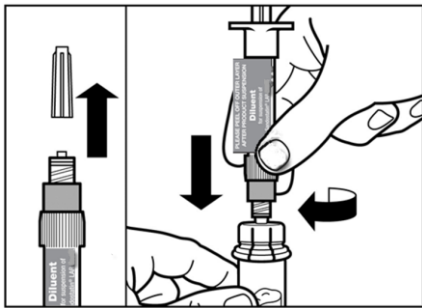
Remove the lid film of the vial adapter packaging, but do NOT remove the vial adapter from its packaging.



Holding the vial adapter packaging, position the vial adapter on top of the vial and push it fully down so that it snaps in place, confirmed by an audible “click.”

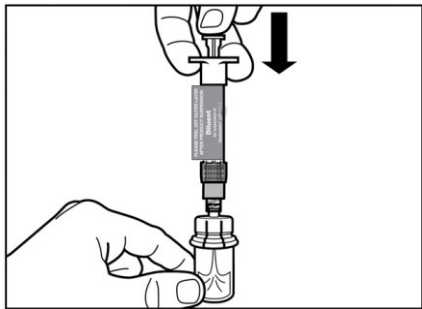


Lift the packaging off the vial adapter with a vertical movement.

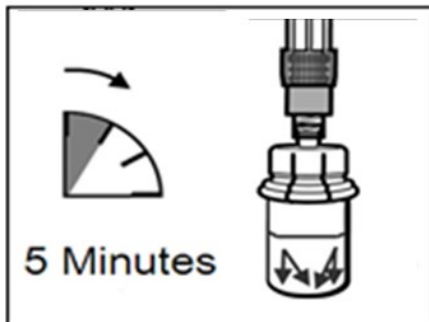


### Step 3

Remove the cap from the syringe prefilled with diluent and screw the syringe onto the vial adapter



Slowly push the plunger all the way down to transfer all the diluent into the vial.

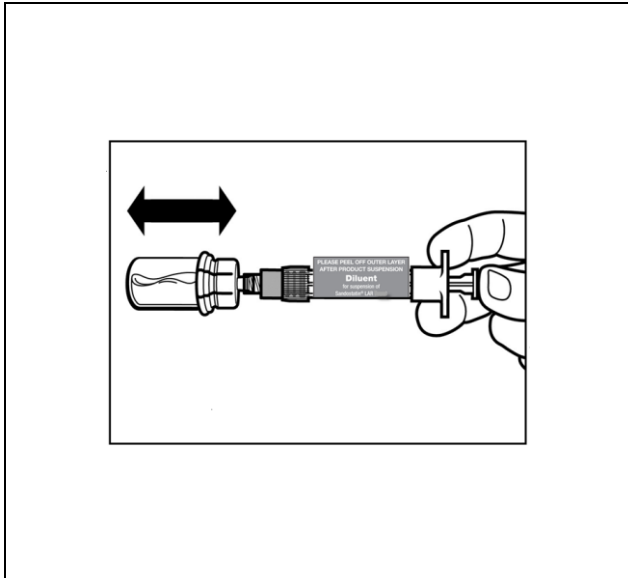


### Step 4

**ATTENTION: It is essential to let the vial stand for 5 minutes** to ensure that the diluent has fully saturated the powder.

Note: It is normal if the plunger rod moves up as there might be a slight overpressure in the vial.

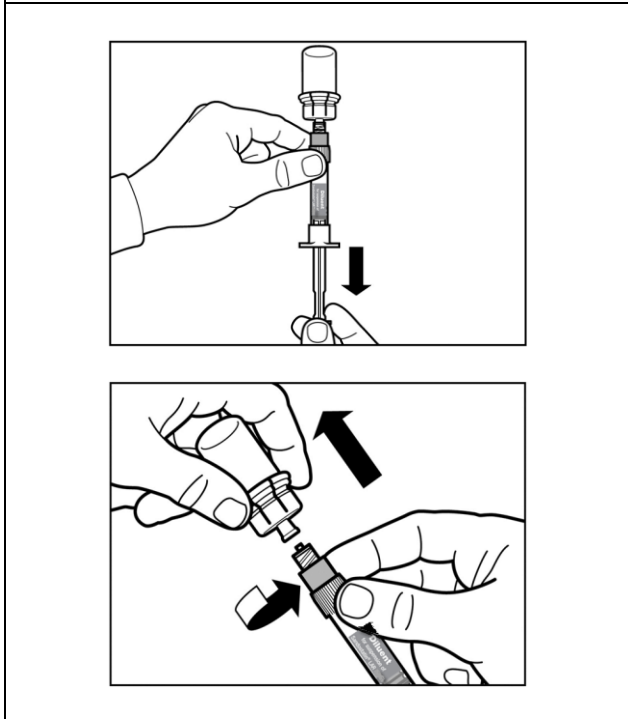
At this stage prepare the patient for injection.



**Step 5**

After the saturation period, make sure that the plunger is pushed all the way down in the syringe.

**ATTENTION:** Keep the plunger pressed and shake the vial **moderately** in a horizontal direction **for a minimum of 30 seconds** so that the powder is completely suspended (milky uniform suspension). **Repeat moderate shaking for another 30 seconds if the powder is not completely suspended.**

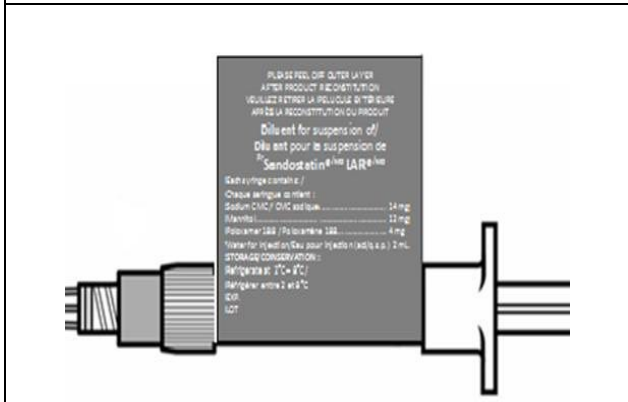


**Step 6**

Prepare injection site with an alcohol wipe.

Turn syringe and vial upside down, slowly pull the plunger back and draw the entire contents from the vial into the syringe.

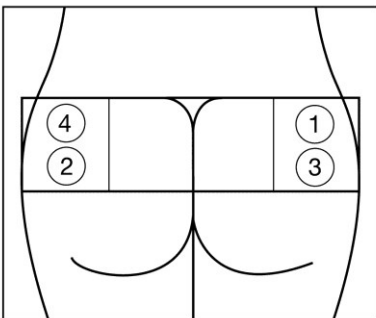
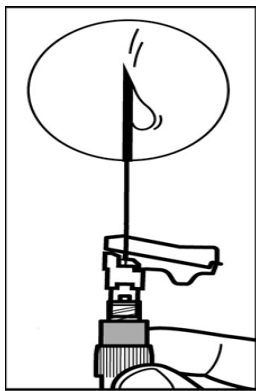
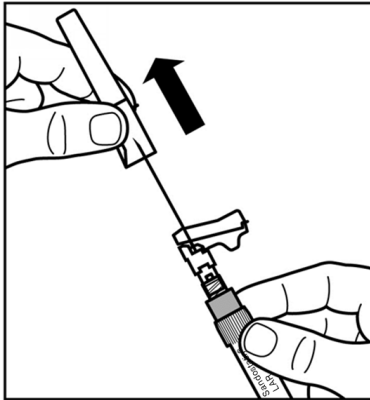
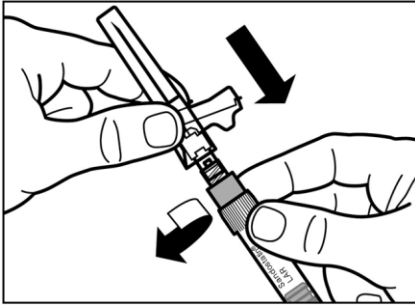
Unscrew the syringe from the vial adapter.



**Step 7**

The product in the syringe now consists of reconstituted SANDOSTATIN LAR Octreotide (as acetate) for Injectable Suspension.

To avoid confusion, peel off the outer syringe label which corresponds only with the diluent. It is no longer a correct representation of the current contents of the syringe.



### Step 8

Screw the safety injection needle onto the syringe.

Gently re-shake the syringe to ensure a milky uniform suspension

Pull the protective cover straight off the needle.

Gently tap the syringe to remove any visible bubbles and expel them from the syringe.

Verify that injection site has not been contaminated.

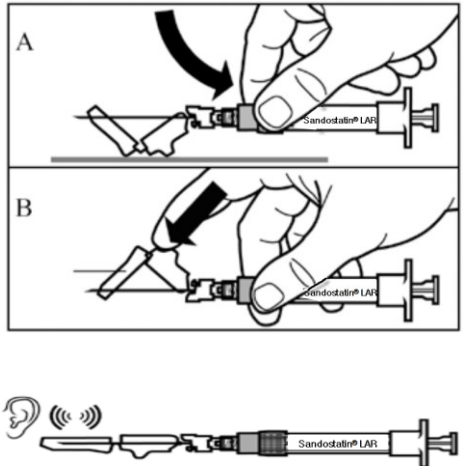
Proceed **immediately** to Step 9 for administration to the patient. Any delay may result in sedimentation.

### Step 9

SANDOSTATIN LAR must be given only by deep intragluteal injection, **NEVER** intravenously.

Insert the needle fully into the left or right gluteus at a 90° angle to the skin.

Slowly pull back the plunger to check that no blood vessel has been penetrated (reposition if a blood vessel has been penetrated).

	<p>Depress the plunger with steady pressure until the syringe is empty. Withdraw the needle from the injection site and activate the safety guard (as shown in <b>Step 10</b>).</p>
	<p><b>Step 10</b></p> <p>Activate the safety guard over the needle in one of the 2 methods shown:</p> <p>A. either press the hinged section of the safety guard down onto a hard surface (figure A)</p> <p>B. or push the hinge forward with your finger (figure B)</p> <p>An audible “click” confirms the proper activation.</p> <p>Dispose of syringe immediately (in a sharps container).</p>

SANDOSTATIN LAR must be given only by deep intragluteal injection, never intravenously. If a blood vessel has been penetrated, another injection site must be selected. The site of repeat intragluteal injection should be alternated between the left and right gluteal muscle. Do not use the same gluteal region each time (every 4 weeks).

**Reconstitution:**

**Parenteral Products:**

**Solution for continuous i.v. infusion:** Immediately prior to use, the contents of the ampoule or multidose vial should be diluted in physiological saline. The volume of dilution will depend on the infusion system used and should be adjusted to ensure a continuous infusion of SANDOSTATIN at a rate of 25 µg/hour. The following are examples of dilutions which may be used:

SANDOSTATIN			Volume of physiological saline	Approximate available volume mL	Nominal concentration µg/mL	Infusion rate mL/h (µg/h)
Concentration µg/mL	Size mL	Volume mL				
500	1	1	49	50	10	2.5 (25)
200	5	2.5	47.5	50	10	2.5 (25)
200	5	3	93	96	6.25	4 (25)

As with all parenteral drugs, i.v. admixtures should be inspected visually for clarity, particulate matter, precipitation, discoloration and leakage prior to administration, whenever solution and container permit.

SANDOSTATIN diluted in physiological saline is stable for 24 hours when stored at room temperature. Discard unused portion.

Octreotide acetate is not stable in Total Parenteral Nutrition (TPN) solutions. It is generally not recommended to mix other medicinal products with octreotide in the same infusion bag or in the same cannula. Physical incompatibilities have been reported (e.g. with pantoprazole).

## **OVERDOSAGE**

### **SANDOSTATIN s.c. Ampoules and Multidose Vials**

A limited number of accidental overdoses of SANDOSTATIN in adults and children have been reported. In adults, the doses ranged from 2,400-6,000 micrograms/day administered by continuous infusion (100-250 micrograms/hour) or subcutaneously (1,500 micrograms t.i.d.). The adverse events reported were arrhythmia, hypotension, cardiac arrest, brain hypoxia, pancreatitis, hepatitis steatosis, diarrhoea, weakness, lethargy, weight loss, hepatomegaly, and lactic acidosis.

In children, the doses ranged from 50 -3,000 microgram/day administered by continuous infusion (2.1-500 micrograms/hour) or subcutaneously (50-100 micrograms). The only adverse event reported was mild hyperglycaemia.

No unexpected adverse events have been reported in cancer patients receiving SANDOSTATIN at doses of 3,000-30,000 micrograms/day in divided doses subcutaneously.

The management of overdose is symptomatic.

### **SANDOSTATIN LAR (Octreotide for Injectable Suspension)**

A limited number of accidental overdoses of SANDOSTATIN LAR have been reported. The doses ranged from 100 mg to 163 mg/month of SANDOSTATIN LAR. The only adverse event reported was hot flushes.

Cancer patients receiving doses of SANDOSTATIN LAR up to 60 mg/month and up to 90 mg/2 weeks have been reported. These doses were in general well tolerated; however, the following adverse events have been reported: frequent urination, fatigue, depression, anxiety, and lack of concentration.

The management of overdose is symptomatic.

## **ACTION AND CLINICAL PHARMACOLOGY**

## **Mechanism of Action**

### **General**

Octreotide acetate is a synthetic octapeptide analogue of naturally occurring somatostatin with similar pharmacological effects, but with a prolonged duration of action. It inhibits pathologically increased secretion of growth hormone (GH) and of peptides and serotonin produced within the gastro-entero-pancreatic (GEP) endocrine system.

In normal healthy subjects, octreotide acetate has been shown to inhibit:

- Release of growth hormone (GH) stimulated by arginine infusion, exercise and insulin-induced hypoglycemia.
- Postprandial release of insulin, glucagon, gastrin, other peptides of the GEP endocrine system, and arginine-stimulated release of insulin and glucagon.
- Thyrotropin releasing hormone (TRH) stimulated release of thyroid stimulating hormone (TSH). The precise mode of action of octreotide acetate on portal hypertension is still unclear. It is thought to reduce splanchnic blood flow primarily by inhibiting vasoactive gastro-intestinal hormone secretion and exerting a direct vasomotor effect on splanchnic vessels, thus reducing portal blood flow. Using human splanchnic veins, it has been shown that vasoconstriction is mediated by type 2 somatostatin receptors.

## **Pharmacokinetics**

### **SANDOSTATIN s.c. Ampoules and Multidose Vials**

After subcutaneous (s.c.) injection of SANDOSTATIN, octreotide acetate is rapidly and completely absorbed. Peak plasma concentrations are reached within 30 minutes. The half-life after subcutaneous administration is 100 minutes. After intravenous injection the elimination is biphasic with  $\alpha$  and  $\beta$  half-lives of approximately 10 and 90 minutes, respectively. The volume of distribution is 0.4 L/Kg body weight and the total body clearance is 160 mL/min. Plasma protein binding amounts to 65% with only negligible amounts bound to red blood cells.

### **SANDOSTATIN LAR (Octreotide as acetate for Injectable Suspension)**

In patients with acromegaly, SANDOSTATIN LAR, a galenic formulation of octreotide consisting of microspheres for depot suspension suitable for repeat intramuscular administration at intervals of four weeks, delivers consistent and therapeutic octreotide serum concentrations thus consistently lowering GH and normalizing IGF-1 serum concentrations in the majority of patients.

In patients with carcinoid tumours and Vasoactive Intestinal Peptide Tumors (VIPomas), treatment with SANDOSTATIN LAR provides continuous control of symptoms related to the underlying disease.

The pharmacokinetic profile of octreotide acetate after injection of SANDOSTATIN LAR reflects the release profile from the polymer matrix and its biodegradation. Once released into the systemic circulation, octreotide distributes according to its known pharmacokinetic properties as described above for SANDOSTATIN administered subcutaneously.



After single intramuscular injections of SANDOSTATIN LAR, the serum octreotide concentration reaches a transient initial peak within one hour after administration followed by progressive decrease to a low undetectable octreotide level within 24 hours. After this initial peak on the first day, octreotide remains at sub-therapeutic levels in the majority of patients for the following seven days. Thereafter, octreotide concentrations increase again, and reach plateau concentrations around day 14 and remain relatively constant during the following three to four weeks. The peak level during day 1 is lower than levels during the plateau phase and no more than 0.5% of the total drug release occurs during day 1. After about day 42, the octreotide concentration decreases slowly, concomitantly with the terminal degradation phase of the polymer matrix dosage form.

In patients with acromegaly, plateau octreotide concentrations after single doses of 10 mg, 20 mg and 30 mg of SANDOSTATIN LAR are 358, 926 and 1710 pg/mL, respectively. Steady state octreotide concentrations reached after three injections at four week intervals, are higher by a factor of approximately 1.6 to 1.8 reaching 1557 and 2384 pg/mL after multiple injections of 20 and 30 mg SANDOSTATIN LAR, respectively.

In patients with carcinoid tumours, the mean octreotide serum concentrations after six doses of 10 mg, 20 mg and 30 mg of SANDOSTATIN LAR administered by intramuscular injection every four weeks were 1231 pg/mL, 2620 pg/mL and 3928 pg/mL, respectively. Concentrations were dose proportional and steady-state concentrations were reached after two injections of 20 and 30 mg and after three injections of 10 mg.

In patients with acromegaly, no accumulation of octreotide beyond that expected from overlapping release profiles occurred over a period of up to 28 monthly SANDOSTATIN LAR injections.

## **STORAGE AND STABILITY**

### **SANDOSTATIN s.c. Ampoules and Multidose Vials**

#### **Ampoules:**

For prolonged storage, SANDOSTATIN ampoules must be stored at 2 to 8 °C.

Keep container in the outer carton in order to protect from light. Do not freeze.

Keep in a safe place out of reach of children and pets.

#### **Multidose Vials:**

For prolonged storage, SANDOSTATIN multidose vials must be stored at 2 to 8 °C.

Keep container in the outer carton in order to protect from light. Do not freeze.

For day-to-day use, both the ampoules and the multidose vials may be stored at room temperature for up to 2 weeks; they must be protected from light. The ampoules should be opened just prior to administration and any unused portion discarded.

Keep in a safe place out of reach of children and pets.

### **SANDOSTATIN LAR (Octreotide for Injectable Suspension):**

The SANDOSTATIN LAR vials must be stored at 2 to 8 °C. Keep vial in the outer carton in order to protect it from light. The vials can remain at room temperature on the day of the injection. However the suspension must only be prepared immediately prior to i.m. injection.

Store the pre-filled syringe with 2 mL diluent at 2 to 8 °C.

Do not freeze.

The SANDOSTATIN LAR powder, once suspended in the diluent, should be used immediately.

Keep in a safe place out of reach of children and pets.

## **DOSAGE FORMS, COMPOSITION AND PACKAGING**

### **SANDOSTATIN Ampoules and Multidose Vials**

SANDOSTATIN (octreotide acetate) is supplied in 1 mL ampoules, each containing 50, 100 or 500 µg of octreotide as acetate. SANDOSTATIN is available in boxes of 5 ampoules.

SANDOSTATIN is also available in 5 mL multidose vials. Each vial contains 1000 µg of octreotide as acetate (200 µg/mL).

### **SANDOSTATIN LAR is supplied in kits containing**

One single dose 6 mL glass vial of SANDOSTATIN LAR (Octreotide for Injectable Suspension) containing 10, 20 or 30 mg of octreotide (as acetate) slow release

- A pre-filled glass syringe containing 2 mL of diluent
- One vial adapter for drug product reconstitution
- One 19G x 1.5" safety injection needle
- An instruction booklet
- The package insert

### **Composition of SANDOSTATIN Ampoules**

<b>Composition</b>	<b>Concentration<sup>1</sup> (µg/mL)</b>
--------------------	--

Composition	Concentration <sup>1</sup> (µg/mL)		
	Octreotide (free peptide*)	50	100
Lactic acid	3,400	3,400	3,400
Mannitol	45,000	45,000	45,000

<sup>1</sup> Water for Injection, q.s. 1.0 mL

\* Present as octreotide acetate

Sodium hydrogen carbonate is added to provide a buffered solution pH 4.2 ± 0.2.

#### **Composition of SANDOSTATIN Multidose Vials**

Composition	Concentration <sup>1</sup> (µg/mL)		
	Octreotide (free peptide)*	200	
Lactic acid	3,400		
Phenol	5,000		
Mannitol	45,000		

<sup>1</sup> Water for Injection, q.s. 1.0 mL

\* Present as octreotide acetate

Sodium hydrogen carbonate is added to provide a buffered solution pH 4.2 ± 0.2.

#### **Composition of the pre-filled syringe (with diluent) for SANDOSTATIN LAR (Octreotide for Injectable Suspension)**

Composition	per syringe
Carboxymethylcellulose sodium	14 mg
Mannitol	12 mg
Poloxamer 188	4 mg
Water for Injection (q.s. ad)	2 mL

#### **Composition of SANDOSTATIN LAR (Octreotide for Injectable Suspension)**

Composition	Concentration (mg/vial)		
	10 mg*/ vial	20 mg*/vial	30 mg*/vial
Octreotide acetate	11.2	22.4	33.6
Poly (DL-lactide-co-glycolide)	188.8	377.6	566.4
Mannitol	41.0	81.9	122.9

\* Octreotide as free peptide

## PART II: SCIENTIFIC INFORMATION

### PHARMACEUTICAL INFORMATION

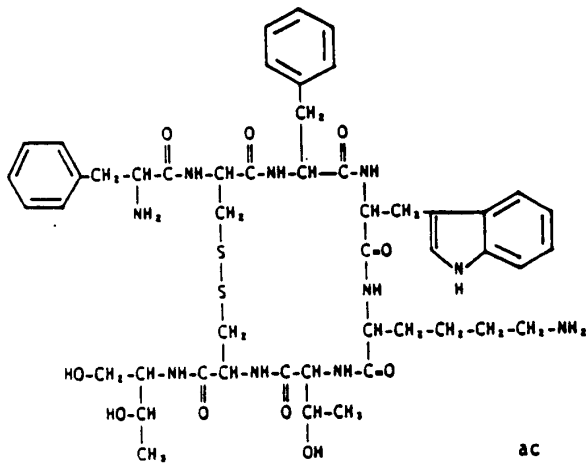
#### Drug Substance

Proper name: octreotide acetate

Chemical name: D-Phenylalanyl-L-hemicystyl-L-phenylalanyl-D-tryptophyl-L-lysyl-L-threonyl-L-hemicystyl-L-threoninol cyclic(2→7) disulfide acetate

Molecular formula and molecular mass:  $C_{49}H_{66}N_{10}O_{10}S_2 \cdot x CH_3COOH$ , 1019.3 x 60.05

Structural formula:



Physicochemical properties:

Octreotide acetate is a bridged octapeptide analogue of somatostatin. It is a white to off-white amorphous lyophilisate, which melts with decomposition; it is very hygroscopic.

The values for pKa (I) and pKa (II) in water are 7.00 and 10.15 respectively. At 25°C, the solubility of octreotide acetate is >10 mg/mL in water; >10 mg/mL in glacial acetic acid and >10 mg/mL in methanol.

## CLINICAL TRIALS

The clinical trials of SANDOSTATIN LAR (octreotide acetate for injectable suspension) were performed in patients who had been receiving subcutaneous SANDOSTATIN (octreotide acetate) for a period of weeks to as long as 10 years. The acromegaly studies with SANDOSTATIN LAR described below were performed in patients who achieved GH levels of <10 ng/mL (and, in most cases <5 ng/mL) while on subcutaneous SANDOSTATIN. However, some patients enrolled were partial responders to subcutaneous SANDOSTATIN, i.e., GH levels were reduced by >50% on subcutaneous SANDOSTATIN Injection compared to the untreated state, although not suppressed to <5 ng/mL.

### Acromegaly

SANDOSTATIN LAR was evaluated in three clinical trials in acromegalic patients.

In two of the clinical trials, a total of 101 patients were entered who had, in most cases, achieved a GH level <5 ng/mL on SANDOSTATIN given in doses of 100 µg or 200 µg t.i.d. Most patients were switched to 20 mg or 30 mg doses of SANDOSTATIN LAR given once every 4 weeks for up to 27 to 28 injections. A few patients received doses of 10 mg and a few required doses of 40 mg. Growth hormone and IGF-1 levels were at least as well controlled with SANDOSTATIN LAR as they had been on SANDOSTATIN and this level of control remained for the entire duration of the trials.

A third trial was a 12-month study that enrolled 151 patients who had a GH level <10 ng/mL after treatment with SANDOSTATIN (most had levels <5 ng/mL). The starting dose of SANDOSTATIN LAR was 20 mg every 4 weeks for 3 doses. Thereafter, patients received 10 mg, 20 mg or 30 mg every 4 weeks, depending upon the degree of GH suppression. (The recommended regimen for these dosage changes is described under DOSAGE AND ADMINISTRATION.) Growth hormone and IGF-1 were at least as well controlled on SANDOSTATIN LAR as they had been on SANDOSTATIN s.c.

Table 4 summarizes the data on hormonal control (GH and IGF-1) for those patients in the first two clinical trials who received all 27 to 28 injections of SANDOSTATIN LAR.

**Table 4 Hormonal Response in Acromegalic Patients Receiving 27 to 28 Injections During<sup>1</sup> Treatment with SANDOSTATIN LAR**

Mean Hormonal Level	SANDOSTATIN s.c.		SANDOSTATIN LAR	
	N	%	N	%
GH < 5.0 ng/mL	69/88	78	73/88	83
< 2.5 ng/mL	44/88	50	41/88	47
< 1.0 ng/mL	6/88	7	10/88	11
IGF-1 normalized	36/88	41	45/88	51
GH < 5.0 ng/mL + IGF-1 normalized	36/88	41	45/88	51
< 2.5 ng/mL + IGF-1 normalized	30/88	34	37/88	42
< 1.0 ng/mL + IGF-1 normalized	5/88	6	10/88	11

<sup>1</sup> Average of monthly levels of GH and IGF-1 over the course of the trials

For the 88 patients in Table 4, a mean GH level of <2.5 ng/mL was observed in 47% receiving SANDOSTATIN LAR. Over the course of the trials 42% of patients maintained mean growth hormone levels of <2.5 ng/mL and mean normal IGF-1 levels.

Table 5 summarizes the data on hormonal control (GH and IGF-1) for those patients in the third clinical trial who received all 12 injections of SANDOSTATIN LAR.

**Table 5 Hormonal Response in Acromegalic Patients Receiving 12 Injections During<sup>1</sup> Treatment with SANDOSTATIN LAR**

Mean Hormonal Level	SANDOSTATIN s.c.		SANDOSTATIN LAR	
	N	%	N	%
GH < 5.0 ng/mL	116/122	95	118/122	97
< 2.5 ng/mL	84/122	69	80/122	66
< 1.0 ng/mL	25/122	21	28/122	23
IGF-1 normalized	82/122	67	82/122	67
GH < 5.0 ng/mL + IGF-1 normalized	80/122	66	82/122	67
< 2.5 ng/mL + IGF-1 normalized	65/122	53	70/122	57
< 1.0 ng/mL + IGF-1 normalized	23/122	19	27/122	22

<sup>1</sup> Average of monthly levels of GH and IGF-1 over the course of the trials

For the 122 patients in Table 5, who received all 12 injections in the third trial, a mean GH level of <2.5 ng/mL was observed in 66% receiving SANDOSTATIN LAR. Over the course of the trial 57% of patients maintained mean growth hormone levels of <2.5 ng/mL and mean normal IGF-1 levels. In comparing the hormonal response in these trials, note that a higher percentage of patients in the third trial suppressed their mean GH to <5 ng/mL on subcutaneous SANDOSTATIN, 95%, compared to 78% across the two previous trials.

In all three trials, GH, IGF-1, and clinical symptoms were similarly controlled on SANDOSTATIN LAR as they had been on SANDOSTATIN.

Of the 25 patients who completed the trials and were partial responders to SANDOSTATIN (GH >5.0 ng/mL but reduced by >50% relative to untreated levels), 1 patient (4%) responded to SANDOSTATIN LAR with a reduction of GH to <2.5 ng/mL and 8 patients (32%) responded with a reduction of GH to <5.0 ng/mL.

Two exploratory open label phase IV studies investigated a 24- and 48-week treatment with SANDOSTATIN LAR in previously untreated acromegalic patients. The median reduction in tumor volume was 20.6% in Study B2402 at 24 weeks (n=46) and 29.2% at 48 weeks (n=29), and 24.5% in Study B2401 at 24 weeks (n=91) and 36.2% at 48 weeks (n=84). The percentage change in tumor volume during the course of the investigation was assessed by MRI for the intent-to-treat population. However, the clinical significance has not been established.

### **Carcinoid Tumors and Vasoactive Intestinal Peptide Tumors (VIPomas)**

A 6-month clinical trial of malignant carcinoid syndrome was performed in 93 patients who had previously been shown to be responsive to SANDOSTATIN. Sixty-seven patients were randomized at baseline to receive, double-blind, doses of 10 mg, 20 mg or 30 mg SANDOSTATIN LAR every 28 days and 26 patients continued, unblinded, on their previous

SANDOSTATIN regimen (100-300 µg t.i.d.).

In any given month after steady-state levels of octreotide were reached, approximately 35%-40% of the patients who received SANDOSTATIN LAR required supplemental subcutaneous SANDOSTATIN therapy usually for a few days, to control exacerbation of carcinoid symptoms. In any given month the percentage of patients randomized to subcutaneous SANDOSTATIN, who required supplemental treatment with an increased dose of SANDOSTATIN, was similar to the percentage of patients randomized to SANDOSTATIN LAR. Over the six-month treatment period approximately 50%-70% of patients who completed the trial on SANDOSTATIN LAR required subcutaneous SANDOSTATIN supplemental therapy to control exacerbation of carcinoid symptoms although steady-state serum SANDOSTATIN LAR levels had been reached.

Table 6 presents the average number of daily stools and flushing episodes in malignant carcinoid patients.

**Table 6 Average No. of Daily Stools and Flushing Episodes (ITT Population)**

Treatment	Daily Stools (Average No.)			Daily Flushing Episodes (Average No.)	
	N	Baseline	Last Visit	Baseline	Last Visit
SANDOSTATIN s.c.	26	3.7	2.6	3.0	0.5
SANDOSTATIN LAR					
10 mg	22	4.6	2.8	3.0	0.9
20 mg	20	4.0	2.1	5.9	0.6
30 mg	24	4.9	2.8	6.1	1.0

Overall, mean daily stool frequency was as well controlled on SANDOSTATIN LAR as on SANDOSTATIN (approximately 2 to 2.5 stools/day).

Mean daily flushing episodes were similar at all doses of SANDOSTATIN LAR and on SANDOSTATIN (approximately 0.5 to 1 episode/day).

In a subset of patients with variable severity of disease, median 24 hour urinary 5-HIAA (5-hydroxyindole acetic acid) levels were reduced by 38%-50% in the groups randomized to SANDOSTATIN LAR.

The reductions are within the range reported in the published literature for patients treated with octreotide (about 10%-50%).

## **DETAILED PHARMACOLOGY**

### **Pharmacodynamics**

Pharmacodynamic studies with SANDOSTATIN (octreotide acetate) in animals have shown that it inhibits secretion of basal and/or stimulated GH, insulin, glucagon in the rat and rhesus monkey and of gastric acid, and exocrine pancreatic enzymes in the rat, with greater potency than natural somatostatin. Octreotide acetate seems to possess some degree of specificity of

pharmacological action in that it is much more potent in suppressing GH and glucagon levels than insulin levels when compared with somatostatin. In addition to its potency, octreotide acetate has a long duration of action with respect to GH inhibition.

Octreotide acetate administration is associated with a minor fall of fasting plasma glucose in monkeys followed by a slight hypersecretion of glucose. In contrast, there occurs a postprandial hyperglycemia, most likely due to an inhibition of insulin.

The pharmacological activities of octreotide acetate in man include inhibition of stimulated GH secretion, stimulated TSH levels, insulin and glucagon release, gut hormone secretion, and decreased portal hypertension. This spectrum of activity resembles that obtained with administration of somatostatin in man.

The actions of somatostatin are mediated by receptors. Five somatostatin receptor subtypes have been identified. Octreotide displays a high affinity for type 2 receptors, a moderate affinity for type 3 and 5 receptors and a very low affinity for type 1 and 4 receptors.

### **Pharmacokinetics**

Pharmacokinetic studies have been performed in rats, dogs and rhesus monkeys after single and multiple doses. The bioavailability of SANDOSTATIN after single subcutaneous (s.c.) injection in rats and dogs was approximately 100%. Highest concentrations were found in liver, kidneys, skin and lungs. Octreotide acetate was metabolized in the rat into smaller peptides, e.g. the dipeptide D-tryptophanlysine. However, as biliary and urinary excretion consisted mainly of unchanged drug, hepatic metabolism appeared slight. A biphasic elimination of octreotide acetate from plasma was also obtained with an  $\alpha$ -disposition half-life of 0.3 to 0.4 hours and a  $\beta$ -phase between 1.2 and 3.2 hours. Multiple administrations did not change the pharmacokinetics of the drug compared to single administration.

In man, octreotide acetate is rapidly and completely absorbed after s.c. injection. Peak plasma concentrations reached after s.c. administration are about half of those obtained after intravenous (i.v.) administration of the same dose. Plasma protein binding is about 65%. The uptake in red blood cells is negligible. After i.v. administration there are two disposition half-lives, a short one of about 10 minutes and a longer one of about 1.5 hours. After s.c. administration to healthy volunteers, the final disposition half-life is about 1.5 hours, the volume of distribution is 6 L and the total body clearance is about 160 mL/min. The absolute bioavailability of octreotide acetate calculated after s.c. administration was rather variable, with values of about 100% for 100  $\mu$ g and about 130% for 50  $\mu$ g and 200  $\mu$ g. There is no significant accumulation under conditions of repeated s.c. administration.

The pharmacokinetic profile of octreotide after intramuscular of SANDOSTATIN LAR reflects the release profile from the polymer matrix and its biodegradation. Once released into the systemic circulation, octreotide distributes according to its known pharmacokinetic profile following administration of SANDOSTATIN s.c.

In patients with acromegaly, plateau octreotide concentrations after single doses of 10, 20 and 30 mg of SANDOSTATIN LAR are 358, 926 and 1710 pg/mL, respectively. Steady state



octreotide concentrations reached after 3 injections at 4-week intervals are higher by a factor of approximately 1.6 to 1.8, reaching 1557 and 2384 pg/mL after multiple injections of 20 and 30 mg, respectively. No accumulation of octreotide beyond that expected from overlapping release profiles occurred over a period of up to 28 monthly SANDOSTATIN LAR injections.

In patients with carcinoid tumours, the mean octreotide serum concentrations after six doses of 10 mg, 20 mg and 30 mg of SANDOSTATIN LAR administered by intramuscular injection every four weeks were 1231 pg/mL, 2620 pg/mL and 3928 pg/mL, respectively. Concentrations were dose proportional and steady-state concentrations were reached after two injections of 20 and 30 mg and after three injections of 10 mg.

## **Clinical Pharmacology**

### **SANDOSTATIN s.c. Ampoules and Multidose vials**

#### **Carcinoid Tumors**

Patients with carcinoid tumors are the most responsive to therapy with approximately 70 to 90% achieving symptom control, characterized by a decrease in diarrhea and flushing. In many cases, this is accompanied by a fall in plasma serotonin and reduced urinary excretion of 5-hydroxyindole acetic acid (5-HIAA). In the event of no beneficial response to SANDOSTATIN treatment, continuation of therapy beyond one week is not recommended, although in non-responders no serious sustained adverse drug effects have been reported.

#### **VIPomas**

The biochemical characteristic of these tumors is over-production of vasoactive intestinal peptide (VIP). In 70% of patients with VIPomas, administration of SANDOSTATIN results in alleviation of the severe secretory diarrhea typical of this condition and consequent improvement in quality of life. This is accompanied by an improvement in associated electrolyte abnormalities, e.g. hypokalemia, enabling enteral and parenteral fluid and electrolyte supplementation to be withdrawn. Clinical improvement is usually accompanied by a reduction in plasma VIP levels, which may fall to the normal reference range.

#### **Acromegaly**

In acromegalic patients (including those who have failed to respond to surgery, irradiation of dopamine agonist treatment), SANDOSTATIN lowers plasma levels of GH and/or somatomedin C. A clinically relevant GH reduction (by 50% or more) occurs in almost all patients, and normalization (plasma GH < 5 ng/mL) can be achieved in about half the cases. In most patients, SANDOSTATIN markedly reduces the clinical symptoms of the disease such as headache, skin and soft tissue swelling, hyperhidrosis, arthralgia, paresthesia. In patients with a large pituitary adenoma, SANDOSTATIN treatment may result in some shrinkage of the tumor mass.

#### **Prevention of complications following pancreatic surgery**

Complications following high risk pancreatic surgery (such as peripancreatic fluid collection, abscess, leaking from the surgical anastomosis, fistula and subsequent sepsis and acute pancreatitis) are chiefly linked with pancreatic proenzyme secretion activated by surgical trauma. They are due to pancreatic juice leaking from the pancreatic remnant and reaching the

peripancreatic region. The action of the activated digestive enzymes leads to severe inflammation and may cause autodestruction of peripancreatic and pancreatic tissue, including intestinal organs and major vessels. SANDOSTATIN inhibits basal and stimulated exocrine pancreatic secretion and, when administered peri- and post-operatively, reduces the incidence of complications following pancreatic surgery.

#### Bleeding Gastro-oesophageal varices

The precise mode of action of SANDOSTATIN on portal hypertension is still unclear. SANDOSTATIN is thought to reduce splanchnic blood flow primarily by inhibiting vasoactive gastro-intestinal hormone secretion and exerting a direct vasomotor effect on splanchnic vessels, thus reducing portal blood flow. Using human splanchnic veins, it has been shown that vasoconstriction is mediated by type 2 somatostatin receptors.

### **SANDOSTATIN LAR (Octreotide for Injectable Suspension)**

#### Acromegaly

In patients with acromegaly, SANDOSTATIN LAR administered intramuscularly at 4-week intervals, delivers consistent and therapeutic octreotide serum concentrations thus consistently lowering GH and normalizing IGF 1 serum concentrations in the majority of patients. In most patients SANDOSTATIN LAR markedly reduces the clinical symptoms of the disease such as headache, perspiration, paresthesia, fatigue, osteoarthralgia and carpal tunnel syndrome. In individual patients with pituitary adenoma, SANDOSTATIN LAR was reported to lead to shrinkage of the tumour mass (see CLINICAL TRIALS section).

#### Carcinoid tumours and VIPomas

In patients with carcinoid tumours and VIPomas, administration of octreotide results in improvement of symptoms, particularly flushing and diarrhea.

## **TOXICOLOGY**

### **ACUTE TOXICOLOGY**

Single intravenous injections of SANDOSTATIN (octreotide acetate) were administered to mice and rats. Animals were observed until death occurred or for a period of seven days following administration.

<b>Species</b>	<b>LD<sub>50</sub>, mg/kg</b>
Mouse	72 (64 - 82)
Rat	18 (15 - 21)

Octreotide acetate caused no unusual effects. Immediately after administration the following signs were observed: numbness, strained and sometimes slower breathing, jumping and roll and stretch cramps. The animals which died did so within one hour, the survivors were without signs after two days.

### Subchronic and Chronic Toxicity

Species	Duration	Route	Dose (mg/kg/d)	Observations
Rats	4 weeks	i.p.	1.0, 4.0, 16.0	<p><u>Low dose</u>: Slightly ↓ feed intake, slight ↑ in serum alkaline phosphatase (SAP) values</p> <p><u>Mid-dose</u>: ↓ weight gain &amp; feed intake, slight ↑ in urine volume &amp; SAP, ↓ serum albumin</p> <p><u>High Dose</u>: Moderate ↓ in weight gain and feed intake, ↓ serum albumin, with slight ↑ in α<sub>2</sub>-globulin, slight ↓ in serum glucose, slight ↑ in SGOT and SAP values, unilateral, small, soft testes in 2 M, inhibited spermiogenesis with atrophy of germinal epithelium of seminiferous tubules in 3M. NOAEL: 4mg/kg/day</p>
Dogs	4 weeks	i.v.	0.2, 0.8, 3.2	<p><u>Low dose</u>: Sporadic diarrhea, occasional prolapse of nictitating membrane, hypersalivation</p> <p><u>Mid dose</u>: Diarrhea, occasional prolapse of nictitating membrane, howling on injection, hyperemia of the skin of the head.</p> <p><u>High dose</u>: Frequent diarrhea, occasional prolapse of nictitating membrane, hypersalivation, hyperemia of the skin of the head, slight weight loss, slight ↑ in urine specific gravity</p> <p>NOAEL: 0.2 mg/kg/day</p>
Rats	26 weeks	i.p.	0.02, 0.1, 1.0	<p><u>Low dose</u>: No significant findings</p> <p><u>Mid dose</u>: No significant findings</p> <p><u>High dose</u>: ↓ feed intake &amp; urine volume ↑ specific gravity of urine in F.</p> <p>NOAEL: 1 mg/kg/day</p>
Dogs	26 weeks + 4 week recovery	i.v.	0.01, 0.05, 0.5	<p><u>Low dose</u>: Sporadic diarrhea, sporadic emesis. Scattered single cell necrosis of acidophils, pituitary gland in one F.</p> <p><u>Mid dose</u>: Frequent diarrhea, sporadic emesis. Pituitary findings as above in 1 F</p> <p><u>High dose</u>: Sporadic emesis. Pituitary findings as above in 1 F and 1M</p> <p><u>All groups</u>: Additional investigation concentrating on determining the nature of the affected pituitary cell showed that octreotide acetate-treated recovery dogs stained positively for prolactin and negatively for growth hormone. Furthermore, plasma levels of prolactin, growth hormone and 17β estradiol were unaffected by octreotide acetate treatment.</p>

Species	Duration	Route	Dose (mg/kg/d)	Observations
Dogs	52 weeks	s.c.	0.24, 0.80, 1.25	<p><u>Low and mid doses:</u> ↓ lactate dehydrogenase (M)</p> <p><u>High dose:</u> ↓ lactate dehydrogenase (M &amp; F). 4 M died due to large tissue masses at the injection sites. All available information at present indicates that the findings are species-specific and have no significance to the use of SANDOSTATIN in humans.</p> <p><u>All groups:</u> ↓ body weight and body weight gain. Local irritation at the injection site (alopecia, encrustation and thickening/swelling of the skin). ↓ creatinine kinase and aspartate amino transferase. ↑alkaline phosphatases (F) and glucose; ↓ sodium levels; total protein, albumin and α globulin; bilirubin and calcium (F).</p> <p><u>Urinalysis:</u> ↓ specific gravity and osmolarity; ↑ volume and pH in F only.</p> <p><u>Microscopically:</u> ↑ incidence of inflammation and hemorrhage of the cutis/subcutis and skin - Abscesses. Sarcomas at the injection sites noted only at 1.25 mg/kg/day. This lesion is considered to be treatment-related. Since the development of sarcomas in sites after repeated injection over long periods of time in rats is a well-known effect, these sarcomas are considered to be expression of a chronic irritant effect of the test article at the high dose level, rather than a direct oncogenic effect.</p>
Dogs	52 weeks	s.c.	0.05, 0.15, 0.30	<p><u>Low dose:</u> Transient ↓ in food intake in M at start of treatment.</p> <p><u>Mid dose:</u> Transient ↓ in food intake in M at the start of treatment and ↓ mean body weight gain in M &amp; F; slight but persistent ↓ in total protein levels (F at week 52).</p> <p><u>High dose:</u> Transient ↓ in food intake in M at start of the treatment and ↓ mean body weight gain in M &amp; F; slight but persistent ↓ in total protein levels (F); high incidence of diarrhea in one F (relationship with treatment not clearly established); ↓ in pancreas weight in M (relationship with the treatment unclear).</p> <p><u>Mid &amp; high doses:</u> ↓ in β phase elimination half-life noted after prolonged administration. Finding may be related to the formation of antibodies to octreotide acetate. No such observations noted in single dose experiments.</p>

Rat	104 weeks	s.c.	0.25, 0.80, 1.25	<p><u>Control</u>: Microscopically observed sarcomas of the skin/subcutis not as severe as treatment groups</p> <p><u>Low dose</u>: ↓ body weight gain from week 7 in F. Microscopically observed sarcomas of the skin/subcutis not as severe high dose group.</p> <p><u>Mid dose</u>: ↓ body weight &amp; body weight gain and ↑relative food consumption in M. Microscopically observed sarcomas of the skin/subcutis not as severe high dose group.</p> <p><u>High dose</u>: ↓ body weight &amp; body weight gain throughout study and ↑ relative food consumption (more severe in M than F). Microscopically observed sarcomas of the skin/subcutis.</p> <p><u>All groups (including control)</u>: Signs of local irritation at injection site including alopecia, encrustations, scabs and thickening/swelling of skin. Microscopically observed ↑incidence of inflammation, fibrosis, necrosis and hemorrhage associated with s.c. masses.</p>
<b>Additional Toxicity Studies</b>				
Species	Duration	Route	Dose (mg/kg/d)	Observations
Dogs	3 weeks	i.v.	0.1 (0.05 b.i.d.)	<p><u>Treatment</u>: Moderate to severe diarrhea, ↓ body weight &amp; feed intake. Little variation in basal levels of prolactin or growth hormone.</p> <p><u>Recovery (staggered recovery periods from 1 to 35 days)</u>: Sections of the pituitary revealed development of proliferation foci and heaped nuclei reaching a maximum at 7 days recovery, no longer apparent at day 35 of recovery. Scattered degenerated cells apparent only on days 21 and 35 of recovery.</p>
Monkey (Rhesus)- 6F	3 weeks	i.v.	1.0 (0.5 b.i.d)	<p><u>Treatment &amp; Recovery periods</u>: No clinical findings attributable to treatment. No diarrhea, no alterations in basal values of plasma GH, PRL or glucose. Pituitary gland showed no morphological alterations. No treatment related findings in other organs. Electron microscopy revealed no treatment-related alterations in the pituitary.</p>
Dogs	26 weeks	i.v.	0.5	<p><u>Treatment</u>: Diarrhea</p> <p><u>Recovery period (staggered from 6 hours to 12 weeks with 2 animals per period)</u>: Focal proliferation and single cell necrosis of pituitary gland. Pituitary function test (dogs treated with an injection of pituitary releasing factor during 1, 8 and 16 weeks of recovery): significant inhibition of stimulated GH release from pituitary up to 8th recovery week; by 14th week, GH response similar to control values.</p>

### Chronic Toxicity Studies with SANDOSTATIN LAR

Species	Duration	Route	N/dose	Dose	Observations
Rat/CR-SD	26 weeks 17 weeks (recovery)	i.m. bilateral injection into biceps femoris muscles	15M/15F 15M (recovery)	0, 2.5 mg in 0.5 mL 0.5% sodium CMC every 4 weeks	<u>All groups (including controls):</u> No deaths and no drug related signs or changes in clinical pathology parameters. Reversible granulomatous myositis at injection sites. Benign hemangiomas at injection site. This is related to the i.m. injection of the Microspheres of SANDOSTATIN LAR
Rat/CR-SD	24 weeks 39 weeks (recovery)	i.m.	50M	0, 2.5 mg	<u>2.5 mg group:</u> ↓ body weights compared to controls. This finding was not present at the end of recovery period. <u>All groups:</u> No treatment related findings. No hyperplastic or neoplastic findings and no hemangiomas at injection sites.

### Special Toxicity Studies with SANDOSTATIN LAR: Local Tolerance

Species	Duration	Route	N/dose	Dose	Observations
Rat/CD	Single dose	i.m. bilateral (gastrocnemius muscle)	18M 9M (Control)	0, 20 mg in 0.2 mL 0.5% sodium CMC	Animals sacrificed sequentially at 9 time points between day 2 and day 92. Microencapsulated octreotide acetate well tolerated with no treatment related clinical signs or findings. No difference in response at injection site between diluent control and drug loaded microspheres.
Rat CR/CD	Single dose	i.m. injection (gastrocnemius muscle)	7M	Control (LAR microsphere diluent); 2 mg	One animal per group sacrificed on days 5, 15, 30, 45, 60, 75 and 90. No adverse histologic findings at injection sites and no difference in muscle histopathology or pattern of microcapsule degradation.
Rabbit NZW	Single dose	i.m. bilateral (sacrospinalis muscles)	9M	0, 25 mg (in 2.0 mL 0.5% sodium CMC)	Animals sacrificed sequentially at 9 time points between day 2 and day 92. Microencapsulated octreotide acetate well tolerated with no treatment-related clinical signs or mortality. No difference in response at injection site between diluent control and drug loaded microspheres.
Rabbit NZW	Single dose	i.m.	7M	Control (LAR microsphere diluent), 25 mg	One animal per group sacrificed on days 5, 15, 30, 45, 60, 75 and 90. No difference in response between diluent control and drug loaded microspheres.

## **Teratological and reproductive studies**

Rats and rabbits were treated intravenously with SANDOSTATIN (octreotide acetate) 0.01, 0.1 or 1 mg/kg/day from day 6 to 15 or 6 to 18 post coitum. Dams and their fetuses were sacrificed at term and examined. In rats and rabbits the 0.01 mg/kg/day dose was well tolerated by the dams but the mid and high doses caused slight dose-dependent weight gain inhibition. No adverse effect on the reproduction data or fetal and placental weight was observed. Morphological findings in fetuses of both species gave no indication of a teratogenic potential of the drug.

In a peri- and post-natal study in rats treated subcutaneously with doses of 0.02, 0.1 or 1.0 mg/kg/day from day 15 post coitum until autopsy on day 21 post-partum, octreotide acetate was well tolerated by the F<sub>0</sub> females of all treatment groups, although slightly lower weight gain during pregnancy was noted in the high dose group. The reduced growth observed in rat pups was most likely a direct consequence of the drug's main pharmacological action, i.e. growth hormone inhibition.

In a fertility and general reproduction performance study in female rats treated subcutaneously, once daily, with doses of 0.02, 0.1 or 1 mg/kg/day, octreotide acetate was well tolerated by the F<sub>0</sub> dams of the lower and mid dose group. In the high dose group, body weight gain was slightly reduced during the 2 weeks preceding mating and there was localized hair loss at the site of injection. Reproduction performance was normal at all dose levels. Prenatal and post-natal development of F<sub>1</sub> offspring was not affected except for some growth retardation. The reproduction performance of F<sub>1</sub> animals as well as the development of the F<sub>2</sub> offspring were also normal.

Animal studies do not indicate direct or indirect harmful effects with respect to pregnancy, embryonal/foetal development, parturition or postnatal development apart from some transient retardation of physiological growth.

## **Mutagenicity**

*In vitro* mutagenicity was tested in *Salmonella typhimurium* strains TA1535, TA1537, TA1538, TA98 and TA100 in the presence and absence of a rat liver S9 homogenate (Ames test). No mutagenic effect was found.

*In vivo* mutagenicity was investigated by means of the micronucleus test using adult CD mice (Charles River). Octreotide acetate was administered intravenously twice within 24 hours. Doses were 5, 16 or 50 mg/kg for each treatment. Controls received the diluent only. Micronuclei were evaluated in bone marrow preparations made 48 or 72 hours after the first administration. Octreotide acetate was not mutagenic in this test system.

In a second *in vivo* mutagenicity test, damage to germ cell DNA was evaluated using the unscheduled DNA synthesis (UDS) technique. Male CD mice were injected intravenously with single doses of either 25 or 50 mg/kg. One hour after the administration of octreotide acetate, the mice received an intra-testicular injection of radioactive marked thymidine. Sperm were taken from the cauda epididymis at various time intervals, counted, and tested for radioactivity in a scintillation counter. In this test system octreotide acetate had no effect on the DNA of germ cells.

The SANDOSTATIN LAR microspheres were devoid of mutagenic potential when tested in a validated *in vitro* bacterial assay.

## Oncogenicity Studies

The results of the oncogenicity studies in rats and mice do not indicate a direct carcinogenic effect of octreotide acetate and are not considered an impediment for human use

Species	Duration	Route	N/dose	Dose (mg/kg/d)	Observations
Rats (KFM-han Wistar)	116 weeks	s.c.	60M 60F	Placebo, NaCl 0.9%, 0.24, 0.80, 1.25	<p><u>Mid &amp; high dose:</u> Marginal but statistically significant ↑ in the relative proportion of lymphocytes by 10 to 8% on average in M of mid &amp; high dose groups, and by 16% on average in F of high group, when compared with the controls. Dose-related ↓ in body weight gain in F</p> <p><u>All groups:</u> No treatment-related differences in intercurrent mortality and food intake.</p> <p>Except for the ↑ incidence of injection site nodule (high dose M in particular) and reproductive tract masses/nodules (high dose F), the macroscopic lesions findings did not distinguish treated from control rats. Fast-growing masses at injection sites, particularly in neck region of M. At 1.25 mg/kg/day and 0.24 mg/kg/day, these masses were recorded earlier and at a higher frequency than in other groups of M. They were identified as subcutaneous sarcomata. Alopecia, crusts, sore spots and (scabbed) wounds at the injection sites of both sexes with a higher incidence in the mid &amp; high dose groups. Dose related ↑ in incidence of ovarian sections without corpora lutea. Within the uterus: dose related ↑ in glandular dilatation and ↑ incidence of luminal dilatation (particularly high dose group) when compared to controls. Endometritis observed in all of the treated groups (particularly high dose), but not the controls.</p>
Mice (KFM-han NMRI)	85/86 weeks (F) 98/99 weeks (M)	s.c.	60M 60F	Placebo, NaCl 0.9%, 0.1, 0.4, 1.2, 2.0	<p><u>0.4, 1.2 &amp; 2 mg/kg/d:</u> ↑ incidence of duodenal mucosal hyperplasia (F) frequently associated with inflammation and duodenal dilatation.</p> <p><u>All treated-groups:</u> No effect in intercurrent mortality, on clinical signs or nodules and masses, food consumption and body weight development. No change in differential blood count. No treatment related change in macroscopical findings. Non neoplastic lesions at the injection sites identical to those observed in control groups. Neoplastic lesions at the injection sites identical to these observed in control groups.</p>



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## PART III: CONSUMER INFORMATION

### SANDOSTATIN® (octreotide acetate injection)

This leaflet is part III of a three-part "Product Monograph" published when SANDOSTATIN® was approved for sale in Canada and is designed specifically for Consumers. This leaflet is a summary and will not tell you everything about SANDOSTATIN. Contact your doctor or pharmacist if you have any questions about the drug.

#### ABOUT THIS MEDICATION

##### What is SANDOSTATIN used for?

SANDOSTATIN (octreotide acetate) is used:

- to control symptoms in patients with gastroenteropancreatic (GEP) endocrine tumors or with acromegaly.
- for the prevention of complications following pancreatic surgery.
- for the emergency treatment of bleeding varices (stretched veins) in the esophagus and stomach in patients with liver disease and as protection from rebleeding.

##### What is a Gastroenteropancreatic (GEP) Endocrine Tumor?

GEP endocrine tumors are growths that have developed from endocrine cells in the gastrointestinal tract (the stomach, intestines, appendix) or the pancreas.

Some symptoms come about because GEP endocrine tumors produce and secrete chemical substances called peptides, i.e. small proteins in excess – overloading the system.

The over-secretion of peptides cause diarrhea and flushing.

Carcinoid tumors (generally occurring in the esophagus, stomach, intestines, appendix, and lungs) and VIPomas (almost always occurring in the pancreas) are the most common type of GEP endocrine tumor.

Diarrhea can cause dehydration, it is therefore very important to control it and replace the loss of water and electrolytes as quickly as possible.

##### What is Acromegaly?

Acromegaly is a life-time, uncommon, debilitating disease characterized by changes in facial bone structure and specific hormonal abnormalities.

Acromegaly is the result of an overproduction of growth hormone by the pituitary gland (a pea-sized gland located at the base of the brain). Uncontrolled disease may lead to arthritis, cardiac and neurologic problems. Approximately 20% to 30% of acromegalic patients also demonstrate high blood pressure.

##### What SANDOSTATIN (octreotide acetate) does?

###### GEP Endocrine Tumors:

SANDOSTATIN works to help slow down the release of the peptides that cause diarrhea and flushing. It also stimulates water absorption.

###### Acromegaly:

SANDOSTATIN has been shown to lower the overproduction of growth hormone by the pituitary gland.

##### When it should not be used:

SANDOSTATIN should not be used if you are allergic to the active ingredient octreotide or to any other ingredient of the formulation.

##### What the medicinal ingredient is:

octreotide acetate.

##### What the important nonmedicinal ingredients are:

The ampoules contain: lactic acid, sodium hydrogen carbonate and water for injection.

The multidose vials contain: lactic acid, sodium hydrogen carbonate, mannitol and water for injection.

##### What dosage forms it comes in:

SANDOSTATIN (octreotide acetate) is a solution supplied in:

- 1 mL ampoules, each containing 50 µg, 100 µg or 500 µg of octreotide as acetate. SANDOSTATIN is available in boxes of 5 ampoules.

and

- 5 mL multidose vials. Each vial contains 1000 µg of octreotide as acetate (200 µg/mL).

#### WARNINGS AND PRECAUTIONS

**BEFORE you use SANDOSTATIN talk to your doctor or pharmacist if you:**

- have high blood pressure (hypertension),
- have problems with your blood sugar levels, either too high or too low (hypoglycaemia),

- have gallstones or have had gallstones in the past, as prolonged use of SANDOSTATIN may result in gallstone formation,
- have problems with your liver (e.g. liver cirrhosis),
- have problems with your kidneys and require dialysis,
- are pregnant, suspect that you may be pregnant,
- are breast feeding,
- have heart problems.

If you receive long treatment with SANDOSTATIN your doctor may wish to check your thyroid function periodically.

There is very little experience with the use of SANDOSTATIN in children.

Women of child-bearing potential should use an effective contraceptive method during treatment.

## INTERACTIONS WITH THIS MEDICATION

### Drugs that may interact with SANDOSTATIN include:

- drugs to control blood pressure (e.g. beta blockers, calcium channel blockers),
- drugs to control blood sugar (e.g. sulfonylureas, insulin, and diazoxide),
- cimetidine,
- cyclosporine,
- bromocriptine.
- anti-diarrheal agents (affect fluid and electrolytes)

Please inform your doctor or pharmacist if you are taking or have recently taken any other drugs or herbal products, even those without a prescription.

SANDOSTATIN is best injected between meals or on retiring to bed. This may reduce the gastrointestinal side effects of SANDOSTATIN.

## PROPER USE OF THIS MEDICATION

### Usual dose:

Your doctor will tell you how much SANDOSTATIN to take each day. SANDOSTATIN is to be injected under your skin (subcutaneous injection). The doctor will also tell you how to divide your dosage through the day.

### How to Prepare Your Injection of SANDOSTATIN?

You will receive your supply of SANDOSTATIN either in ampoules or multidose vials. The ampoules or multidose vials should be visually inspected and not used in the presence of floating particles or discoloration.

### a) Ampoules

1. Before breaking open the ampoule, tap the neck portion so that any medication that may be trapped will flow down into the bottom portion of the ampoule.
2. Once the ampoule is opened, insert the needle and pull back the plunger to fill the syringe with the desired amount of drug. (Your doctor or nurse will tell you how to read the markings on your syringe so that you can fill it with the right amount of drug for your dose.) Discard any unused medication.
3. Check to see if there are any air bubbles in the syringe. If bubbles do appear, hold the syringe upright (with the needle pointed up) and lightly tap the barrel. This should make the bubbles rise to the top of the syringe. Then gently press the plunger to push the bubbles out.

### b) Multidose Vials

1. Peel off the aluminum seal.
2. Wipe the top of the vial with an alcohol swab.
3. Remove the cap from the needle and insert the needle into the vial through the rubber stopper.
4. Leave the needle in the bottle.
5. Turn the vial and the syringe upside down. Keep the needle tip within the liquid. Pull the plunger and carefully withdraw the prescribed amount of SANDOSTATIN (your doctor or nurse will tell you how to read the markings on the syringe so that you fill it with the correct amount of drug for your dose).
6. Turn the bottle and syringe back upright.
7. Withdraw the needle from the vial.
8. Check to see if there are any air bubbles in the syringe. If bubbles do appear, hold the syringe upright (with the needle pointed up) and lightly tap the barrel. This should make the bubbles rise to the top of the syringe. Then gently press the plunger to push the bubbles out.

### How to Inject Your Dose of SANDOSTATIN

1. Choose the area of your hip, thigh, or abdomen where you want to make your injection.
2. Clean the site with a fresh alcohol wipe, and keep it nearby.
3. Hold the syringe like a pencil, and remove the needle cap.
4. Use the thumb and forefinger of your other hand to

gently pinch up a fold of skin at the place you want to inject. This will lift the subcutaneous tissue away from the muscle underneath.

5. Hold the syringe at a 45° angle, and insert the entire length of the needle into the fold of skin in one quick motion.
6. Once the needle is inserted, let go of the skin.
7. Using your free hand, pull back on the plunger slightly to check whether you have placed the needle in a blood vessel. (You don't want to.) If any blood appears in the syringe, this is not a proper site for your injection. You will have to remove and discard the syringe and needle and start over.
8. Once the needle is inserted properly, slowly inject all of the medication.
9. When you are finished injecting the medicine, place your alcohol wipe where the needle enters the skin. Press lightly.
10. Withdraw the needle at the same angle it is inserted.
11. Gently hold the wipe on your skin for about five seconds.
12. Put the cap back on the needle and dispose of the syringe and needle safely. Do not reuse the syringe and needle. Single-use syringes and needles are used to reduce the chance of infection. Collect your used needles and syringes in a metal container, such as a coffee can, and then dispose of them in a covered garbage can. This will keep others (especially children) from injuring themselves.

#### Important Points to Remember

Pay close attention to the amount of drug you are taking into the syringe for injection. Make sure it is the amount your doctor has prescribed for you.

#### Missed Dose:

If you forget to take a scheduled injection, check with your doctor. Do not double your dose at the next injection.

#### Overdose:

No life-threatening reactions have been reported after overdosage of SANDOSTATIN.

If you think you have injected more SANDOSTATIN than you should, contact your doctor or poison control center in your area.

### **SIDE EFFECTS AND WHAT TO DO ABOUT THEM**

Like all medicines SANDOSTATIN may cause some side effects. If you experience any of these, tell your doctor.

Some patients have experienced a burning sensation at the injection site. For most people, the burning lasts only a few moments. Injecting the drug at room temperature rather than cold from the refrigerator may alleviate the burning sensation.

#### **Serious side effects**

- Gallstones, leading to sudden back pain.
- Too much or too little sugar in the blood.
- Underactive thyroid gland (hypothyroidism) causing changes in heart rate, appetite or weight; tiredness, feeling cold, or swelling at the front of the neck.
- Changes in thyroid function tests.
- Inflammation of the gallbladder (cholecystitis).
- Impaired glucose tolerance.
- Irregular heart beat (slow or fast).
- Thirst, low urine output, dark urine, dry flushed skin.
- Hypersensitivity (allergic) reactions including skin rash.
- ~~A type of an allergic reaction (anaphylaxis) which can cause difficulty in swallowing or breathing, swelling and tingling, possibly with a drop in blood pressure with dizziness or loss of consciousness.~~
- ~~A type of an allergic reaction (anaphylaxis) which causes difficulty in swallowing or breathing, rash, hives, swelling of the face, lips, tongue or throat, tingling, possibly with a drop in blood pressure with dizziness or loss of consciousness.~~
- Acute inflammation of the pancreas gland causing severe stomach pain (pancreatitis).
- Liver inflammation (hepatitis); symptoms may include yellowing of the skin and eyes (jaundice), nausea, vomiting, loss of appetite, generally feeling unwell, itching, light-coloured urine.
- Low level of platelet ~~count~~ in blood (thrombocytopenia); ~~this could result in~~ increased bleeding or bruising, fatigue, weakness.

#### **Other side effects**

The side effects listed below are usually mild and tend to disappear as treatment progresses.

- nausea
- vomiting
- stomach pain
- diarrhea
- feeling of fullness in the stomach
- flatulence (wind)
- loss of appetite
- constipation
- headache
- stomach discomfort after meal
- fatty stools
- loose stools

- discoloration of faeces
- dizziness
- change in liver function tests
- hair loss
- shortness of breath.

Since gallstones may occasionally form during prolonged use of SANDOSTATIN, your doctor may wish to check your gallbladder periodically.

SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM				
Symptom / effect		Talk with your doctor or pharmacist		Your medication should be withheld or stopped. Talk with your doctor.
		Only if severe	In all cases	
<b>Common</b>	- Formation of gallstones in the gallbladder (severe pain in the upper right abdomen which may last for several hours, particularly after a fatty meal, possible nausea or vomiting)		√	
<b>Uncommon</b>	- Acute pancreatitis (inflammation of the pancreas gland causing severe stomach pain)			√
	)			√
	- Diabetes (symptoms include unusual thirst, frequent urination, extreme fatigue or lack of energy, tingling or numbness in the hands or feet)		√	

SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM				
Symptom / effect		Talk with your doctor or pharmacist		Your medication should be withheld or stopped. Talk with your doctor.
		Only if severe	In all cases	
	- Underactive thyroid gland (hypothyroidism) causing changes in heart rate, appetite or weight; tiredness, feeling cold, or swelling at the front of the neck.		√	
	- Liver inflammation (hepatitis); symptoms may include yellowing of the skin and eyes (jaundice), nausea, vomiting, loss of appetite, generally feeling unwell, itching, light-coloured urine.		√	
	- Irregular heart beat (slow or fast)		√	
<b>Unknown</b>	- Low level of platelet in blood (thrombocytopenia); increased bleeding or bruising, fatigue, weakness		√	
	- Allergic reaction (anaphylaxis) (difficulty in swallowing or breathing, rash, hives, swelling of the face, lips, tongue or throat, tingling, possibly with a drop in blood pressure with dizziness or loss of consciousness)			√

*This is not a complete list of side effects. For any unexpected effects while taking SANDOSTATIN, contact your doctor or pharmacist.*

#### REPORTING SUSPECTED SIDE EFFECTS

To monitor drug safety, Health Canada through the Canada Vigilance Program collects information on serious and unexpected side effects of drugs. If you suspect you have had a serious or unexpected reaction to this drug you may notify Canada Vigilance:

You can report any suspected adverse reactions associated with the use of health products to the Canada Vigilance Program by one of the following 3 ways:

- Report online at [www.healthcanada.gc.ca/medeffect](http://www.healthcanada.gc.ca/medeffect)
- Call toll-free at 1-866-234-2345
- Complete a Canada Vigilance Reporting Form and:
  - Fax toll-free to 1-866-678-6789, or
  - Mail to: Canada Vigilance Program  
Health Canada  
Postal Locator 0701C  
Ottawa, ON K1A 0K9

Postage paid labels, Canada Vigilance Reporting Form and the adverse reaction reporting guidelines are available on the MedEffect™ Canada Web site at [www.healthcanada.gc.ca/medeffect](http://www.healthcanada.gc.ca/medeffect).

NOTE: Should you require information related to the management of side effects, contact your health professional. The Canada Vigilance Program does not provide medical advice.

This document plus the full product monograph, prepared for health professionals can be found at:

[www.novartis.ca](http://www.novartis.ca)

or by contacting the sponsor, Novartis Pharmaceuticals Canada Inc., at:  
1-800-363-8883

This leaflet was prepared by Novartis Pharmaceuticals Canada Inc.

SANDOSTATIN is a registered trademark

Last revised: January 24, 2018

#### HOW TO STORE IT

SANDOSTATIN must be stored at 2° to 8°C (in a refrigerator). However, you may leave your daily dose of SANDOSTATIN (ampoules or multidose vials) out at a room temperature of up to 30°C for up to 2 weeks. The ampoules should be opened just prior to administration and any unused portion **discarded**.

Keep the container in the outer carton in order to protect from light. Do not freeze.

Do not use SANDOSTATIN (ampoules or multidose vials) after the expiry date.

Keep in a safe place out of reach and sight of children and pets.

#### MORE INFORMATION



## PART III: CONSUMER INFORMATION

### SANDOSTATIN<sup>®</sup> LAR<sup>®</sup> (octreotide acetate for injectable suspension)

This leaflet is part III of a three-part "Product Monograph" published when SANDOSTATIN<sup>®</sup> LAR<sup>®</sup> was approved for sale in Canada and is designed specifically for Consumers. This leaflet is a summary and will not tell you everything about SANDOSTATIN LAR. Contact your doctor or pharmacist if you have any questions about the drug.

#### ABOUT THIS MEDICATION

##### What is SANDOSTATIN LAR used for?

SANDOSTATIN LAR (octreotide acetate) is used to control symptoms associated with gastroenteropancreatic (GEP) endocrine tumors and acromegaly in patients who are adequately controlled with SANDOSTATIN<sup>®</sup>.

##### What is a Gastroenteropancreatic (GEP) Endocrine Tumor?

GEP endocrine tumors are growths that have developed from endocrine cells in the gastrointestinal tract (the stomach, intestines, appendix) or the pancreas.

Some symptoms come about because GEP endocrine tumors produce and secrete chemical substances called peptides, i.e. small proteins in excess – overloading the system.

- The over-secretion of peptides cause diarrhea and flushing.

Carcinoid tumors (generally occurring in the esophagus, stomach, intestines, appendix, and lungs) and VIPomas (almost always occurring in the pancreas) are the most common type of GEP endocrine tumor.

Diarrhea can cause dehydration, it is therefore very important to control it and replace the loss of water and electrolytes as quickly as possible.

##### What is Acromegaly?

Acromegaly is a life-time, uncommon, debilitating disease characterized by changes in facial bone structure and specific hormonal abnormalities.

Acromegaly is the result of an overproduction of growth hormone by the pituitary gland (a pea-sized gland located at the base of the brain). Uncontrolled disease may lead to arthritis, cardiac and neurologic problems. Approximately 20% to 30% of acromegalic patients also demonstrate high blood pressure.

##### What SANDOSTATIN (octreotide acetate) does?

##### GEP Endocrine Tumors:

SANDOSTATIN works to help slow down the release of the peptides that cause diarrhea and flushing. It also stimulates water absorption.

##### Acromegaly:

SANDOSTATIN LAR has been shown to lower the overproduction of growth hormone by the pituitary gland

##### When it should not be used:

SANDOSTATIN LAR should not be given to anyone who is allergic to octreotide or any other ingredient of the formulation.

##### What the medicinal ingredient is:

octreotide acetate.

##### What the important nonmedicinal ingredients are:

The powder contains: poly (DL-lactide-co-glycolide) and mannitol.

The diluent contains: carboxymethylcellulose sodium, mannitol, poloxamer 188 and sterile water.

##### What dosage forms it comes in:

SANDOSTATIN LAR is available as powder in vials and is supplied in a kit which includes:

- One glass vial of SANDOSTATIN LAR containing either 10, 20 or 30 mg of octreotide (as acetate) slow release;
- A pre-filled glass syringe containing 2 mL of diluent to be used for suspending the powder;
- One vial adapter to be used for delivering the diluent from the pre-filled syringe to the vial, without a needle;
- One 19G x 1.5" safety injection needle;
- An instruction booklet for detailed directions for use;
- A package insert for dosage and administration and detailed directions for use.

#### WARNINGS AND PRECAUTIONS

**BEFORE you use SANDOSTATIN LAR talk to your doctor or pharmacist if you:**

- have high blood pressure (hypertension),
- have problems with your blood sugar levels, either too high or too low (hypoglycaemia),

- have gallstones or have had gallstones in the past, as prolonged use of SANDOSTATIN LAR may result in gallstone formation,
- have problems with your liver (e.g. liver cirrhosis),
- have problems with your kidneys and require dialysis,
- are pregnant or suspect that you may be pregnant,
- are breast feeding.
- have heart problems.

If you receive long treatment with SANDOSTATIN LAR your doctor may wish to check your thyroid function periodically.

There is very little experience with the use of SANDOSTATIN in children.

Women of child-bearing potential should use an effective contraceptive method during treatment.

## INTERACTIONS WITH THIS MEDICATION

**Drugs that may interact with SANDOSTATIN LAR include:**

- drugs to control blood pressure (e.g. beta blockers, calcium channel blockers),
- drugs to control blood sugar (e.g. sulfonylureas, insulin, and diazoxide),
- cimetidine,
- cyclosporine,
- bromocriptine.
- anti-diarrheal agents (affect fluid and electrolytes)

Please inform your doctor or pharmacist if you are taking or have recently taken any other drugs or herbal products, even those without a prescription.

## PROPER USE OF THIS MEDICATION

SANDOSTATIN LAR is to be given to you by your doctor or nurse as an injection into the muscle of the buttocks. With repeated administration the left and right buttock should be used alternately.

Inspect the vials. Do not use if the vial is damaged, the powder is discoloured, or contains unusual particulate matter.

**Dose:** One vial every 4 weeks

**Usual starting dose:** 20 mg every 4 weeks. The dose may be changed later depending on your condition.

**Missed Dose:**

If you miss your injection, please contact your doctor as soon

as possible.

**Overdose:**

No life-threatening reactions have been reported after overdose of SANDOSTATIN LAR.

If you think you have been given more SANDOSTATIN LAR than you should, talk to your doctor or nurse immediately.

## SIDE EFFECTS AND WHAT TO DO ABOUT THEM

Like all medicines SANDOSTATIN LAR may cause some side effects. If you experience any of these, tell your doctor.

A few people experience pain at the injection site, which usually lasts for only a short time (usually about one hour), and sometimes swelling and rash.

**Some side effects can be serious**

- Gallstones, leading to sudden back pain.
- Too much or too little sugar in the blood.
- Underactive thyroid gland (hypothyroidism) causing changes in heart rate, appetite or weight; tiredness, feeling cold, or swelling at the front of the neck.
- Changes in thyroid function tests.
- Inflammation of the gallbladder (cholecystitis).
- Impaired glucose tolerance.
- Irregular heart beat (slow or fast).
- Thirst, low urine output, dark urine, dry flushed skin.
- Hypersensitivity (allergic) reactions including skin rash.
- ~~A type of an allergic reaction (anaphylaxis) which can cause difficulty in swallowing or breathing, swelling and tingling, possibly with a drop in blood pressure with dizziness or loss of consciousness.~~
- ~~A type of an allergic reaction (anaphylaxis) which causes difficulty in swallowing or breathing, rash, hives, swelling of the face, lips, tongue or throat, tingling, possibly with a drop in blood pressure with dizziness or loss of consciousness.~~
- 
- Acute inflammation of the pancreas gland causing severe stomach pain (pancreatitis).
- Liver inflammation (hepatitis); symptoms may include yellowing of the skin and eyes (jaundice), nausea, vomiting, loss of appetite, generally feeling unwell, itching, light-coloured urine.
- Low level of platelet ~~count~~ in blood (thrombocytopenia); ~~this could result in~~ increased bleeding or bruising, fatigue, weakness.

**Other side effects**

The side effects listed below are usually mild and tend to disappear as treatment progresses.

- nausea
- vomiting
- stomach pain
- diarrhea
- feeling of fullness in the stomach
- flatulence (wind)
- loss of appetite
- constipation
- headache
- stomach discomfort after meal
- fatty stools
- discoloration of faeces
- dizziness
- change in liver function tests
- hair loss
- shortness of breath.

Since gallstones may occasionally form during prolonged use of SANDOSTATIN, your doctor may wish to check your gallbladder periodically.

<b>SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM</b>				
Symptom / effect		Talk with your doctor or pharmacist		Your medication should be withheld or stopped. Talk with your doctor.
		Only if severe	In all cases	
<b>Common</b>	- Formation of gallstones in the gallbladder (severe pain in the upper right abdomen which may last for several hours, particularly after a fatty meal, possible nausea or vomiting)		√	
<b>Uncommon</b>	- Acute pancreatitis (inflammation of the pancreas gland causing severe stomach pain)			√

<b>SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM</b>				
Symptom / effect		Talk with your doctor or pharmacist		Your medication should be withheld or stopped. Talk with your doctor.
		Only if severe	In all cases	
	)			√
	- Diabetes (symptoms include unusual thirst, frequent urination, extreme fatigue or lack of energy, tingling or numbness in the hands or feet)		√	
	- Underactive thyroid gland (hypothyroidism) causing changes in heart rate, appetite or weight; tiredness, feeling cold, or swelling at the front of the neck.		√	
	- Liver inflammation (hepatitis); symptoms may include yellowing of the skin and eyes (jaundice), nausea, vomiting, loss of appetite, generally feeling unwell, itching, light-coloured urine.		√	
	- Irregular heart beat (slow or fast)		√	
<b>Unknown</b>	- Low level of platelet in blood (thrombocytopenia) ; increased bleeding or bruising, fatigue, weakness		√	

**SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM**

Symptom / effect		Talk with your doctor or pharmacist		Your medication should be withheld or stopped. Talk with your doctor.
		Only if severe	In all cases	
	- Allergic reaction (anaphylaxis) (difficulty in swallowing or breathing, rash, hives, swelling of the face, lips, tongue or throat, tingling, possibly with a drop in blood pressure with dizziness or loss of consciousness, swelling)			√

*This is not a complete list of side effects. For any unexpected effects while taking SANDOSTATIN LAR, contact your doctor or pharmacist.*

**REPORTING SUSPECTED SIDE EFFECTS**

To monitor drug safety, Health Canada through the Canada Vigilance Program collects information on serious and unexpected side effects of drugs. If you suspect you have had a serious or unexpected reaction to this drug you may notify Canada Vigilance:

You can report any suspected adverse reactions associated with the use of health products to the Canada Vigilance Program by one of the following 3 ways:

- Report online at [www.healthcanada.gc.ca/medeffect](http://www.healthcanada.gc.ca/medeffect)
- Call toll-free at 1-866-234-2345
- Complete a Canada Vigilance Reporting Form and:
  - Fax toll-free to 1-866-678-6789, or
  - Mail to: Canada Vigilance Program  
Health Canada  
Postal Locator 0701C  
Ottawa, ON K1A 0K9

Postage paid labels, Canada Vigilance Reporting Form and the adverse reaction reporting guidelines are available on the MedEffect™ Canada Web site at [www.healthcanada.gc.ca/medeffect](http://www.healthcanada.gc.ca/medeffect).

NOTE: Should you require information related to the management of side effects, contact your health professional. The Canada Vigilance Program does not provide medical advice.

**HOW TO STORE IT**

The SANDOSTATIN LAR powder and diluent should be stored at 2° to 8°C (in a refrigerator). Do not freeze. Keep the vial in the outer carton in order to protect it from light. The vials should be allowed to reach room temperature on the day of the injection, but must be protected from light. However, the suspension must only be prepared immediately before injection. Once removed from the refrigerator, the vials will usually reach room temperature within 30 to 60 minutes.

Do not use SANDOSTATIN LAR after the expiry date.

Keep in a safe place out of reach and sight of children and pets.

**MORE INFORMATION**

This document plus the full product monograph, prepared for health professionals can be found at:

[www.novartis.ca](http://www.novartis.ca)

or by contacting the sponsor, Novartis Pharmaceuticals

Canada Inc., at:  
1-800-363-8883

This leaflet was prepared by  
Novartis Pharmaceuticals Canada Inc.  
Dorval, Quebec  
H9S 1A9

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