
LACTULOSE SOLUTION, USP

LACTULOSE SOLUTION, USP 10g/15mL For Oral Administration Rx Only

DESCRIPTION

Lactulose solution is a synthetic disaccharide in solution form for oral administration. Each 15 mL of lactulose contains: 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose, and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6. The pH range is 2.5 to 6.5.

Lactulose solution is a colonic acidifier which promotes laxation.

The chemical name for lactulose is 4-O-ß-D-galactopyranosyl-D-fructofuranose. It has the following structural formula:

C ₁₂H ₂₂O ₁₁

The molecular weight is 342.30. It is freely soluble in water.

CLINICAL PHARMACOLOGY

Lactulose is poorly absorbed from the gastrointestinal tract and no enzyme capable of hydrolysis of this disaccharide is present in human gastrointestinal tissue. As a result, oral doses of lactulose reach the colon virtually unchanged. In the colon, lactulose is broken down primarily to lactic acid, and also to small amounts of formic and acetic acids, by the action of colonic bacteria, which results in an increase in osmotic pressure and slight acidification of the colonic contents. This in turn causes an increase in stool water content and softens the stool.

Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be slow, 24 to 48 hours may be required to produce the desired

bowel movement.

Lactulose given orally to man and experimental animals resulted in only small amounts reaching the blood. Urinary excretion has been determined to be 3% or less and is essentially complete within 24 hours.

INDICATIONS AND USAGE

For the treatment of constipation. In patients with a history of chronic constipation, lactulose solution therapy increases the number of bowel movements per day and the number of days on which bowel movements occur.

CONTRAINDICATIONS

Since lactulose solution contains galactose (less than 1.6 g/15 mL), it is contraindicated in patients who require a low galactose diet.

WARNINGS

A theoretical hazard may exist for patients being treated with lactulose solution who may be required to undergo electrocautery procedures during proctoscopy or colonoscopy. Accumulation of H2 gas in significant concentration in the presence of an electrical spark may result in an explosive reaction. Although this complication has not been reported with lactulose, patients on lactulose therapy undergoing such procedures should have a thorough bowel cleansing with a non-fermentable solution. Insufflation of CO $_2$ as an additional safeguard may be pursued but is considered to be a redundant measure.

PRECAUTIONS

General

Since lactulose solution contains galactose (less than 1.6 g/15 mL) and lactose (less than 1.2 g/15 mL), it should be used with caution in diabetics.

Information for Patients

In the event that an unusual diarrheal condition occurs, contact your physician.

Laboratory Tests

Elderly, debilitated patients who receive lactulose for more than six months should have serum electrolytes (potassium, chloride, carbon dioxide) measured periodically.

Drug Interactions

Results of preliminary studies in humans and rats suggest that non-absorbable antacids given concurrently with lactulose may inhibit the desired lactulose-induced drop in colonic pH. Therefore, a possible lack of desired effect of treatment should be taken into consideration before such drugs are given concomitantly with lactulose solution.

Carcinogenesis, Mutagenesis, Impairment of Fertility

There are no known human data on long-term potential for carcinogenicity, mutagenicity, or impairment of fertility.

There are no known animal data on long-term potential for mutagenicity.

Administration of lactulose solution in the diet of mice for 18 months in concentrations of 3 and 10 percent (v/w) did not produce any evidence of carcinogenicity.

In studies in mice, rats, and rabbits, doses of lactulose solution up to 6 or 12 mL/kg/day produced no deleterious effects in breeding, conception, or parturition.

Pregnancy

Teratogenic Effects

Reproduction studies have been performed in mice, rats, and rabbits at doses up to 3 or 6 times the usual human oral dose and have revealed no evidence of impaired fertility or harm to the fetus due to lactulose. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when lactulose solution is administered to a nursing woman.

Pediatric Use

Safety and effectiveness in pediatric patients have not been established.

ADVERSE REACTIONS

Precise frequency data are not available.

Initial dosing may produce flatulence and intestinal cramps, which are usually transient. Excessive dosage can lead to diarrhea with potential complications such as loss of fluids, hypokalemia, and hypernatremia.

Nausea and vomiting have been reported.

To report SUSPECTED ADVERSE REACTIONS, contact Xttrium Laboratories, Inc. at 1-800-587-3721 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

OVERDOSAGE

Signs and Symptoms

There have been no reports of accidental overdosage. In the event of overdosage, it is expected that diarrhea and abdominal cramps would be the major symptoms. Medication should be terminated.

Oral LD50

The acute oral LD50 of the drug is 48.8 mL/kg in mice and greater than 30 mL/kg in rats.

Dialysis

Dialysis data are not available for lactulose. Its molecular similarity to sucrose, however, would suggest that it should be dialyzable.

DOSAGE AND ADMINISTRATION

The usual dose is 1 to 2 tablespoonfuls (15 to 30 mL, containing 10 g to 20 g of lactulose) daily. The dose may be increased to 60 mL daily if necessary. Twenty-four to 48 hours may be required to produce a normal bowel movement.

NOTE: Some patients have found that lactulose solution may be more acceptable when mixed with fruit juice, water, or milk.

HOW SUPPLIED

Lactulose Solution, USP 10 g/15 mL is a colorless to yellow, unflavored solution available in the following container sizes:

15 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-15)

30 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-30)

8 fl. oz. (237 mL) white bottles (NDC 0116-4005-08)

16 fl. oz. (473 mL) white bottles (NDC 0116-4005-16)

32 fl. oz. (946 mL) white bottles (NDC 0116-4005-32)

Lactulose solution contains lactulose 667 mg/mL (10 g/15 mL).

Store at 20 ° to 25 °C (68 ° to 77 °F) [see USP Controlled Room Temperature]. Do not freeze.

Under recommended storage conditions, a normal darkening of color may occur. Such darkening is characteristic of sugar solutions and does not affect therapeutic action.

Prolonged exposure to temperatures above 30 °C (86 °F) or to direct light may cause extreme darkening and turbidity which may be pharmaceutically objectionable. If this condition develops, do not use.

Prolonged exposure to freezing temperatures may cause change to a semisolid, too viscous to pour. Viscosity will return to normal upon warming to room temperature.

Dispense in original container or in a tight, light-resistant container as defined in the USP, with a child-resistant closure.

To The Pharmacist: When ordering this product, include the product number (or NDC) in the description.

Rx Only

Revised: March 2022

Distributed by:

Xttrium Laboratories, Inc.

1200 E. Business Center Dr.

Mount Prospect, IL 60056

LACTULOSE 80Z (237 mL)

NDC 0116-4005-08

LACTULOSE SOLUTION, USP

10g/15mL

INDICATIONS: For the Treatment of Constipation

Each 15 mL of lactulose solution contains: 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose,

and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6.

USUAL ADULT DOSAGE: 1 to 2 tablespoonfuls (15 to 30 mL) daily. See attached insert for full prescribing information.

Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be

slow, 24 to 48 hours may be required to produce a normal bowel movement.

Some patients have found that lactulose solution may be more acceptable when mixed with fruit juice, water, or milk.

Dispense in original container or in a tight, light-resistant container with child-resistant closure.

Store at 20° to 25°C (68° to 77°F) [see USP Controlled Room Temperature]. Do not freeze.

Product may darken slightly but therapeutic action is not affected. Do not use if extreme darkening or turbidity occurs.

See accompanying product information.

Keep tightly closed.

PHARMACIST: When ordering this product, include the NDC number in the description. **Distributed by:**

Xttrium Laboratories, Inc.

1200 E. Business Center Dr.

Mount Prospect, IL 60056

Rx Only

Net Contents: 8 fl oz (237mL)

4005LACT08LBL

Rev. 03/2022

DESCRIPTION

Lactulose solution is a synthetic disaccharide in solution form for oral administration, Each 15 mL of lactulose contains: 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose, and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6. The pH range is 2.5 to 6.5.

Lactulose solution is a colonic acidifier which promotes laxation.

The chemical name for lactulose is 4-0-β-D-galactopyranosyl-D-fructofuranose. It has the following structural formula:



NDC 0116-4005-08

LACTULOSE SOLUTION, USP

10 g/15 mL

Indications: For the Treatment of Constipation

Each 15 mL of lactulese solution contains: 10 g lactulese (and less than 1.5 g galactose, less than 1.2 g lactuse, and 1.2 g or less of other sugars). Also contains water, D&C Vellow No. 10, and FD&C Vellow No. 6. USUAL ADULT DISAGE: 1 to 2 tablespoonide (15 to 30 mil) daily. See attached insert for full prescribing information. Since lactuities does not exact its effect until it reaches the colon, and since transit time through the colon may be stow, 24 to 48 hours may be required to produce a normal bowel movement. Some patients have frend that factuities extution may be more acceptable when mixed with that juice, water, or milk.

Dispense in original container or in a tight, light resistant container with child-resistant closure Store at 20° to 25°C (68° to 77°F) [see USP Controlled Room Temperature]. Do not freeze.

Product may darken slightly but the rapsuric action is not affected. Do not use if extreme darkening or turbidity occurs. See accompanying product information. Keep tightly closed.

PHARMA CIST: When ordering this product, include the NDC number in the description.

Distributed by: Xtrium Laboratories, Inc. 1200 E. Businoss Contor Dr. Mount Prospect, IL 60056

Rx Only

Net Contents: 8 fl oz (237 mL)



4005LACTOBLBL Rev. 03/2022



DESCRIPTION

Lactulose solution is a synthetic disaccharide in solution form for oral administration. Each 15 mL of lactulose contains: 10 a lactulose land less than 1.6 g galactose, less than 1.2 g glactose, and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6. The pH range is 2.5 to 6.5.

C12H22O11

Lactulose solution is a colonic acidifier which promotes laxation.
The chemical name for lactulose is

4-0-β-D-galactopyranosyl-D-fructofuranose. It has the following structural formula:

C12H22O11

The molecular weight is 342.30. It is freely soluble in water

CLINICAL PHARMACOLOGY

Lactulose is poorly absorbed from the gastrointestinal tract and no enzyme capable of hydrolysis of this disaccharide is present in human gastrointestinal tissue. As a result, oral doses of lactulose reach the colon virtually unchanged. In the colon, lactulose is broken down primarily to lactic acid, and also to small amounts of formic and acetic acids, by the action of colonic bacteria, which results in an increase in osmotic pressure and slight acidification of the colonic contents. This in turn causes an increase in stool water content and softens

Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be slow, 24 to 48 hours may be required to produce the desired bowel movement.

Lactulose given orally to man and experimental animals resulted in only small amounts reaching the blood. Urinary excretion has been determined to be 3% or

less and is essentially complete within

INDICATIONS AND USAGE

For the treatment of constipation. In patients with a history of chronic constipation, lactulose solution therapy increases the number of bowel movements per day and the number of days on which bowel movements occur.

CONTRAINDICATIONS

Since lactulose solution contains galactose (less than 1.6 g/15 mL), it is contraindicated in patients who require a low galactose diet.

WARNINGS

A theoretical hazard may exist for patients being treated with lactulose solution who may be required to undergo solution who may be required to undergo electrocautery procedures during proctoscopy or colonoscopy. Accumulation of H₂ gas in significant concentration in the presence of an electrical spark may result in an explosive reaction. Although this complication has not been reported with lactulose, patients on lactulose therapy

undergoing such procedures should have a thorough bowel cleansing with a non-fermentable solution. Insufflation of non-fermentable solution. Insufflation or CO₂ as an additional safeguard may be pursued but is considered to be a redundant measure.

PRECAUTIONS

General Since lactulose solution contains galactose (less than 1.6 g/15 mL) and lactose (less than 1.2 g/15 mL), it should be used with caution in diabetics.

Information for Patients

In the event that an unusual diarrheal condition occurs, contact your physician.

Laboratory Tests Elderly, debilitated patients who receive lactulose for more than six months should have serum electrolytes (potassium, chloride, carbon dioxide) measured periodically.

Drug Interactions

Results of preliminary studies in humans and rats suggest that non-absorbable antacids given concurrently with lactulose may inhibit the desired

lactulose-induced drop in colonic pH. Therefore, a possible lack of desired effect of treatment should be taken into consideration before such drugs are given concomitantly with lactulose

Carcinogenesis, Mutagenesis, Impairment of Fertility There are no known human data on

long-term potential for carcinogenicity, mutagenicity, or impairment of fertility.

There are no known animal data on long-term potential for mutagenicity

Administration of lactulose solution in the diet of mice for 18 months in concentrations of 3 and 10 percent (v/w) did not produce any evidence of carcinogenicity.

In studies in mice, rats, and rabbits, doses of lactulose solution up to 6 or 12 mL/kg/day produced no deleterious effects in breeding, conception, or

Pregnancy

Teratogenic Effects Reproduction studies have been performed in mice, rats, and rabbits at doses up to 3 or 6 times the usual human oral dose and have revealed no evidence of impaired fertility or harm to the fetus due to lactulose. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed

Nursing Mothers It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when lactulose solution is administered to a nursing woman.

Pediatric Use Safety and effectiveness in pediatric patients have not been established.

ADVERSE REACTIONS

Precise frequency data are not available.

Initial dosing may produce flatulence and intestinal cramps, which are usually transient. Excessive dosage can lead to diarrhea with potential complications such as loss of fluids, hypokalemia, and hypokalemia, and hypernatremia.

Nausea and vomiting have been

To report SUSPECTED ADVERSE REACTIONS, contact Xttrium Laboratories, Inc. at 1-800-587-3721 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

OVERDOSAGE

Signs and Symptoms There have been no reports of accidental overdosage. In the event of overdosage, it is expected that diarrhea and abdominal cramps would be the major symptoms. Medication should be terminated.

Oral LD_{50} The acute oral LD_{50} of the drug is 48.8 mL/kg in mice and greater than 30 mL/kg in rats.

Dialysis Dialysis data are not available for lactulose, its molecular similarity to sucrose, however, would suggest that it should be dialyzable.

DOSAGE AND ADMINISTRATION

The usual dose is 1 to 2 tablespoonfuls (15 to 30 mL, containing 10 g to 20 g of lactulose) daily. The dose may be increased to 60 mL daily if necessary. Twenty-four to 48 hours may be required to produce a normal bowel movement.

NOTE: Some patients have found that lactulose solution may be more acceptable when mixed with fruit juice, water, or milk.

HOW SUPPLIED

Lactulose Solution, USP 10 g/15 mL is a colorless to yellow, unflavored solution available in the following container sizes:

15 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-15)

30 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-30)

8 fl. oz. (237 mL) white bottles (NDC 0116-4005-08)

16 fl. oz. (473 mL) white bottles (NDC 0116-4005-16)

32 fl. oz. (946 mL) white bottles (NDC 0116-4005-32)

Lactulose solution contains lactulose 667 mg/mL (10 g/15 mL).

Store at 20° to 25°C (68° to 77°F) [see USP Controlled Room Temperature]. Do not freeze.

Under recommended storage conditions, a normal darkening of color may occur. Such darkening is characteristic of sugar solutions and does not affect therapeutic action.

Prolonged exposure to temperatures above 30 °C (86 °F) or to direct light may cause extreme darkening and turbidity which may be pharmaceutically objectionable. If this condition develops, do not use.

Prolonged exposure to freezing temperatures may cause change to a semisolid, too viscous to pour. Viscosity will return to normal upon warming to room temperature.

Dispense in original container or in a tight, light-resistant container as defined in the USP, with a child-resistant closure.

To The Pharmacist: When ordering this product, include the product number (or NDC) in the description

Rx Only

Revised: March 2022

Distributed by: Xttrium Laboratories, Inc. 1200 E. Business Center Dr. Mount Prospect, IL 60056

LACTULOSE SOLUTION, USP

10g/15mL

INDICATIONS: For the Treatment of Constipation

Each 15 mL of lactulose solution contains: 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose,

and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6.

USUAL ADULT DOSAGE: 1 to 2 tablespoonfuls (15 to 30 mL) daily. See attached insert for full prescribing information.

Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be

slow, 24 to 48 hours may be required to produce a normal bowel movement.

Some patients have found that lactulose solution may be more acceptable when mixed with fruit juice, water, or milk.

Dispense in original container or in a tight, light-resistant container with child-resistant closure.

Store at 20° to 25°C (68° to 77°F) [see USP Controlled Room Temperature]. Do not freeze.

Product may darken slightly but therapeutic action is not affected. Do not use if extreme darkening or turbidity occurs.

See accompanying product information.

Keep tightly closed.

PHARMACIST: When ordering this product, include the NDC number in the description.

Distributed by:

Xttrium Laboratories, Inc. 1200 E. Business Center Dr. Mount Prospect, IL 60056

Rx Only

Net Contents: 16 fl oz (473mL)

4005LACT16LBL

Rev. 03/2022

DESCRIPTION

Lactulose solution is a synthetic disaccharide in solution form for oral administration. Each 15 mL of lactulose contains: 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose, and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6.

The pH range is 2.5 to 6.5.

Lactulose solution is a colonic acidifier which promotes laxation.

The chemical name for lactulose is $4\text{-}0\text{-}\beta\text{-}D\text{-}galactopyranosyl-}D\text{-}fructofuranose.$ It has the following structural formula:



NDC 0116-4005-16

LACTULOSE SOLUTION, USP

10 g/15 mL

Indications: For the Treatment of Constipation

Each 15 mL of lactulose solution contains: 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose, and 1.2 g or less of other sugars), Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6.

USUAL ADULT DOSAGE: 1 to 2 tablespoonfuls (15 to 30 mL) daily. See attached insert for full prescribing information. Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be slow, 24 to 48 hours may be required to produce a normal bowel movement.

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See accompanying product information.

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PHARMACIST: When ordering this product, include the NDC number in the description.

Distributed by: **Rx Only** Xttrium Laboratories, Inc. Net Contents: 16 fl oz (473 mL) 1200 E. Business Center Dr.

Mount Prospect, IL 60056 0116-4005-16

4005LACT16LBL Rev. 03/2022



Lactulose Solution, USP

Rx only

DESCRIPTION

Lactulose solution is a synthetic disaccharide in solution form for oral administration. Each 15 mL of lactulose contains: 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose, and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6. The pH range is 2.5 to 6.5.

Lactulose solution is a colonic acidifier which promotes laxation.

The chemical name for lactulose is

4-0-β-D-galactopyranosyl-D-fructofuranose. It has the following structural formula:

C12H22O11

The molecular weight is 342.30. It is freely soluble in water.

CLINICAL PHARMACOLOGY

Lactulose is poorly absorbed from the gastrointestinal tract and no enzyme capable of hydrolysis of this disaccharide is present in human gastrointestinal tissue. As a result, oral doses of lactulose reach the colon virtually unchanged. In the colon, lactulose is broken down primarily to lactic acid, and also to small amounts of formic and acetic acids, by the action of colonic bacteria, which results in an increase in osmotic pressure and slight acidification of the colonic contents. This in turn causes an increase in stool water content and softens the stool.

Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be slow, 24 to 48 hours may be required to produce the desired bowel movement.

Lactulose given orally to man and experimental animals resulted in only small amounts reaching the blood. Urinary excretion has been

Information for Patients

In the event that an unusual diarrheal condition occurs, contact your physician.

Laboratory Tests

Elderly, debilitated patients who receive lactulose for more than six months should have serum electrolytes (potassium, chloride, carbon dioxide) measured periodically.

Drug Interactions

Results of preliminary studies in humans and rats suggest that non-absorbable antacids given concurrently with lactulose may inhibit the desired lactulose-induced drop in colonic pH. Therefore, a possible lack of desired effect of treatment should be taken into consideration before such drugs are given concomitantly with lactulose solution.

Carcinogenesis, Mutagenesis, Impairment of Fertility

There are no known human data on long-term potential for carcinogenicity, mutagenicity, or impairment of fertility.

There are no known animal data on long-term potential for mutagenicity.

Administration of lactulose solution in the diet of mice for 18 months in concentrations of 3 and 10 percent (v/w) did not produce any evidence of carcinogenicity.

In studies in mice, rats, and rabbits, doses of lactulose solution up to 6 or 12 mL/kg/day produced no deleterious effects in breeding, conception, or parturition.

Pregnancy

Teratogenic Effects

Reproduction studies have been performed in mice, rats, and rabbits at doses up to 3 or 6 times the usual human oral dose and have revealed no evidence of impaired fertility or harm to the fetus due to lactulose. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when lactulose solution is administered to a nursing woman.

Pediatric Use

determined to be 3% or less and is essentially complete within 24 hours.

INDICATIONS AND USAGE

For the treatment of constipation. In patients with a history of chronic constipation, lactulose solution therapy increases the number of bowel movements per day and the number of days on which bowel movements occur.

CONTRAINDICATIONS

Since lactulose solution contains galactose (less than 1.6 g/15 mL), it is contraindicated in patients who require a low galactose diet.

WARNINGS

A theoretical hazard may exist for patients being treated with lactulose solution who may be required to undergo electrocautery procedures during proctoscopy or colonoscopy. Accumulation of H2 gas in significant concentration in the presence of an electrical spark may result in an explosive reaction. Although this complication has not been reported with lactulose, patients on lactulose therapy undergoing such procedures should have a thorough bowel cleansing with a non-fermentable solution. Insufflation of CO2 as an additional safeguard may be pursued but is considered to be a redundant measure.

PRECAUTIONS

General

Since lactulose solution contains galactose (less than 1.6 g/15 mL) and lactose (less than 1.2 g/15 mL), it should be used with caution in diabetics.

Safety and effectiveness in pediatric patients have not been established.

ADVERSE REACTIONS

Precise frequency data are not available.

Initial dosing may produce flatulence and intestinal cramps, which are usually transient. Excessive dosage can lead to diarrhea with potential complications such as loss of fluids, hypokalemia, and hypernatremia.

Nausea and vomiting have been reported.

To report SUSPECTED ADVERSE REACTIONS, contact Xttrium Laboratories, Inc. at 1-800-587-3721 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

OVERDOSAGE

Signs and Symptoms

There have been no reports of accidental overdosage. In the event of overdosage, it is expected that diarrhea and abdominal cramps would be the major symptoms. Medication should be terminated.

Oral LD₅₀

The acute oral LD₅₀ of the drug is 48.8 mL/kg in mice and greater than 30 mL/kg in rats.

Dialysis

Dialysis data are not available for lactulose. Its molecular similarity to sucrose, however, would suggest that it should be dialyzable.

Pregnancy Teratogenic Effects

Reproduction studies have been performed in mice, rats, and rabbits at doses up to 3 or 6 times the usual human oral dose and have revealed no evidence of impaired fertility or harm to the fetus due to lactulose. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when lactulose solution is administered to a nursing woman.

Pediatric Use Safety and effectiveness in pediatric patients have not been established. ADVERSE REACTIONS Precise frequency data are not available. Initial dosing may produce flatulence and intestinal cramps, which are usually transient. Excessive dosage can lead to diarrhea with potential complications such as loss of fluids, hypokalemia, and hypernatremia.

Nausea and vomiting have been reported. To report SUSPECTED ADVERSE REACTIONS, contact Xttrium Laboratories. Inc. at 1-800-587-3721 or FDA at 1-800-FDA-1088 or

www.fda.gov/medwatch OVERDOSAGE

Signs and Symptoms
There have been no reports of accidental
overdosage. In the event of overdosage, it
is expected that diarrhea and abdominal cramps would be the major symptoms. Medication should be terminated.

Oral LDsn The acute oral LD₅₀ of the drug is 48.8 mL/kg in mice and greater than 30 mL/kg in rats.

Dialysis

Dialysis data are not available for lactulose.

Its molecular similarity to sucrose owever, would suggest that it should be dialyzable.

DOSAGE AND ADMINISTRATION

The usual dose is 1 to 2 tablespoonfuls (15 to 30 mL, containing 10 g to 20 g of lactulose) daily. The dose may be increased to 60 mL daily if necessary. Twenty-four to 48 hours may be required to produce a normal bowel movement

NOTE: Some patients have found that when mixed with fruit juice, water, or milk.

HOW SUPPLIED

Lactulose Solution, USP 10 g/15 mL is a colorless to yellow, unflavored solution available in the following container sizes: 15 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-15) 30 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-30)

8 fl. oz. (237 mL) white bottles (NDC 0116-4005-08) 16 fl. oz. (473 mL) white bottles (NDC 0116-4005-16) 32 fl. oz. (946 mL) white bottles (NDC 0116-4005-32)

Lactulose solution contains lactulose 667 mg/mL (10 g/15 mL).

Store at 20° to 25°C (68° to 77°F) [see USP Controlled Room Temperature]. Do not

Under recommended storage conditions, a normal darkening of color may occur. Such darkening is characteristic of sugar solutions and does not affect therapeutic action.

Prolonged exposure to temperatures above 30 °C (86 °F) or to direct light may cause extreme darkening and turbidity which may be pharmaceutically objectionable. If this condition develops, do not use. Prolonged exposure to freezing temperatures

may cause change to a semisolid, too viscous to pour. Viscosity will return to normal upon warming to room temperature. Dispense in original container or in a tight. light-resistant container as defined in the USP, with a child-resistant closure.

To The Pharmacist: When ordering this product. include the product number (or NDC) in th description

Rx Only Revised: March 2022 Distributed by: Xttrium Laboratories, Inc. 1200 E. Business C Mount Prospect, IL 60056

LACTULOSE 320Z (946 mL)

NDC 0116-4005-32

LACTULOSE SOLUTION, USP

10g/15mL

INDICATIONS: For the Treatment of Constipation

Each 15 mL of lactulose solution contains: 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose,

and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6.

USUAL ADULT DOSAGE: 1 to 2 tablespoonfuls (15 to 30 mL) daily. See attached insert for full prescribing information.

Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be

slow, 24 to 48 hours may be required to produce a normal bowel movement.

Some patients have found that lactulose solution may be more acceptable when mixed with fruit juice, water, or milk.

Dispense in original container or in a tight, light-resistant container with child-resistant closure.

Store at 20° to 25°C (68° to 77°F) [see USP Controlled Room Temperature]. Do not freeze.

Product may darken slightly but therapeutic action is not affected. Do not use if extreme darkening or turbidity occurs.

See accompanying product information.

Keep tightly closed.

PHARMACIST: When ordering this product, include the NDC number in the description.

Distributed by:

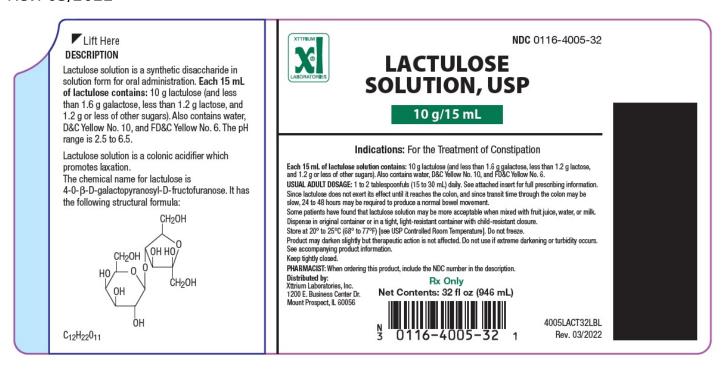
Xttrium Laboratories, Inc. 1200 E. Business Center Dr. Mount Prospect, IL 60056

Rx Only

Net Contents: 32 fl oz (946 mL)

4005LACT32LBL

Rev. 03/2022



Lift Here DESCRIPTION

Lactulose solution is a synthetic disaccharide in solution form for oral administration. Each 15 mL of lactulose contains: 10 a lactulose (and less than 1.6 g galactose, less than 1.2 g lactose, and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6. The pH range is 2.5 to 6.5

Lactulose solution is a colonic acidifier which promotes laxation.

The chemical name for lactulose is 4-0-β-D-galactopyranosyl-D-fructofuranose. It has the following structural formula:

C₁₂H₂₂O₁₁

The molecular weight is 342.30. It is freely soluble in water.

CLINICAL PHARMACOLOGY

Lactulose is poorly absorbed from the gastrointestinal tract and no enzyme capable of hydrolysis of this disaccharide is present in human gastrointestinal tissue. As a result, oral doses of lactulose reach the colon virtually unchanged. In the colon, lactulose is broken down primarily to lactic acid, and also to small amounts of formic and acetic acids, by the action of colonic bacteria, which and slight acidification of the colonic contents. This in turn causes an increase in stool water content and softens the stool.

Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be slow, 24 to 48 hours may be required to produce the desired bowel movement

Lactulose given orally to man and experimental animals resulted in only small amounts reaching the blood. Urinary excretion has been determined to be 3% or less and is essentially complete within 24 hours.

INDICATIONS AND USAGE

For the treatment of constipation. In patients with a history of chronic constipation, lactulose solution therapy increases the number of bowel movements per day and the number of days on which

CONTRAINDICATIONS

Since lactulose solution contains galactose (less than 1.6 g/15 mL), it is contraindicated in patients who require a low galactose diet.

A theoretical hazard may exist for patients being treated with lactulose solution who may be required to undergo electrocautery procedures during proctoscopy or colonoscopy. Accumulation of H2 gas in significant concentration in the pr an electrical spark may result in an explosive reaction. Although this complication has not been reported with

lactulose, patients on lactulose therapy undergoing such procedures should have a thorough bowel cleansing with a non-fermentable solution. Insufflation of CO2 as an additional safeguard may be pursued but is considered to be a redundant measure.

PRECAUTIONS

General

Since lactulose solution contains galactose (less than 1.6 g/15 mL) and lactose (less than 1.2 g/15 mL), it should be used with caution in diabetics

Information for Patients
In the event that an unusual diarrheal condition occurs, contact your physician.

Laboratory Tests Elderly, debilitated patients who receive lactulose for more than six months should have serum electrolytes (potassium. chloride, carbon dioxide) measured periodically.

Drug Interactions Results of preliminary studies in humans

and rats suggest that non-absorbable antacids given concurrently with lactulose may inhibit the desired lactulose-induced drop in colonic pH. Therefore, a possible lack of desired effect of treatment should be taken into consideration before such drugs are given concomitantly with lactulose solution.

Carcinogenesis, Mutagen

Impairment of Fertility
There are no known human data on long-term potential for carcinogenicity, mutagenicity, or impairment of fertility.

There are no known animal data on long-term potential for mutagenicity

Administration of lactulose solution in the diet of mice for 18 months in concentrations of 3 and 10 percent (v/w) did not produce any evidence of carcinogenicity.

In studies in mice, rats, and rabbits, doses of lactulose solution up to 6 or 12 mL/kg/day produced no deleterious effects in breeding, conception, or parturition.

Teratogenic Effects
Reproduction studies have been performed in mice, rats, and rabbits at doses up to 3 or 6 times the usual human oral dose a have revealed no evidence of impaired fertility or harm to the fetus due to lactulose. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when lactules solution is administered to a nursing

Pediatric Use Safety and effectiveness in pediatric patients have not been established.

ADVERSE REACTIONS

Precise frequency data are not available.

Initial dosing may produce flatulence and intestinal cramps, which are usually transient. Excessive dosage can lead to diarrhea with potential complications such as loss of fluids, hypokalemia, and

Nausea and vomiting have been reported.

To report SUSPECTED ADVERSE REACTIONS, contact Xttrium Laboratories, Inc. at 1-800-587-3721 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch

OVERDOSAGE

Signs and Symptoms

There have been no reports of accidental overdosage. In the event of overdosage, it is expected that diarrhea and abdominal cramps would be the major symptoms. Medication should be terminated.

Oral LDso

The acute oral LD₅₀ of the drug is 48.8 mL/kg in mice and greater than 30 mL/kg in rats.

Dialysis data are not available for lactulose. Its molecular similarity to such however, would suggest that it should be dialyzable.

DOSAGE AND ADMINISTRATION

The usual dose is 1 to 2 tablespoonfuls (15) to 30 mL, containing 10 g to 20 g of lactulose) daily. The dose may be increased to 60 mL daily if necessary. Twenty-four to 48 hours may be required to produce a normal bowel movement

NOTE: Some patients have found that lactulose solution may be more acceptable when mixed with fruit juice, water, or milk.

HOW SUPPLIED

Lactulose Solution, USP 10 g/15 mL is a colorless to yellow, unflavored solution available in the following container sizes:

15 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-15)

30 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-30)

8 fl. oz. (237 mL) white bottles (NDC 0116-4005-08)

16 fl. oz. (473 mL) white bottles (NDC 0116-4005-16)

32 fl. oz. (946 mL) white bottles (NDC 0116-4005-32)

Lactulose solution contains lactulose 667 mg/mL (10 g/15 mL).

Store at 20° to 25°C (68° to 77°F) [see not freeze.

Under recommended storage conditions, a normal darkening of color may occur. Such darkening is characteristic of sugar solutions and does not affect therapeutic action.

Prolonged exposure to temperatures above 30 °C (86 °F) or to direct light may cause extreme darkening and turbidity which may be pharmaceutically objectionable. If this condition develops, do not use.

Prolonged exposure to freezing temperatures may cause change to a semisolid, too viscous to pour. Viscosity will return to

normal upon warming to room temperature.

Dispense in original container or in a tight, light-resistant container as defined in the USP, with a child-resistant closure

To The Pharmacist: When ordering this product, include the product number (or NDC) in the description

Rx Only

Revised: March 2022

Distributed by:

Xttrium Laboratories, Inc. 1200 E. Business Center Dr. Mount Prospect, IL 60056

LACTULOSE 15mL UNIT DOSE CUP

UNIT DOSE

Delivers 15mL

NDC 0116-4005-15

LACTULOSE SOLUTION, USP

10g/15mL

Rx Only

Xttrium Laboratories, Inc.

Mount Prospect, IL 60056

4005LACT15LID



LACTULOSE 30 mL UNIT DOSE CUP

UNIT DOSE

Delivers 30mL

NDC 0116-4005-30

LACTULOSE SOLUTION, USP

20g/30mL

Rx Only

Xttrium Laboratories, Inc.

4005LACT30LID



Prescribing Information Insert

Lactulose Solution, USP FOR ORAL ADMINISTRATION

Rx Only



Lactulose Solution, USP FOR ORAL ADMINISTRATION

Rx Only

Lactulose Solution, USP

Rx only

DESCRIPTION

Lactulose solution is a synthetic disaccharide in solution form for oral administration. **Each 15 mL of lactulose contains:** 10 g lactulose (and less than 1.6 g galactose, less than 1.2 g lactose, and 1.2 g or less of other sugars). Also contains water, D&C Yellow No. 10, and FD&C Yellow No. 6. The pH range is 2.5 to 6.5.

Lactulose solution is a colonic acidifier which promotes laxation.

The chemical name for lactulose is

4-0-β-D-galactopyranosyl-D-fructofuranose. It has the following

Information for Patients

In the event that an unusual diarrheal condition occurs, contact your physician.

Laboratory Tests

Elderly, debilitated patients who receive lactulose for more than six months should have serum electrolytes (potassium, chloride, carbon dioxide) measured periodically.

Drug Interactions

Results of preliminary studies in humans and rats suggest that non-absorbable antacids given concurrently with lactulose may inhibit the desired lactulose-induced drop in colonic pH. Therefore, a possible lack of desired effect of treatment should be taken into consideration

structural formula:

C₁₂H₂₂O₁₁

The molecular weight is 342.30. It is freely soluble in water.

CLINICAL PHARMACOLOGY

Lactulose is poorly absorbed from the gastrointestinal tract and no enzyme capable of hydrolysis of this disaccharide is present in human gastrointestinal tissue. As a result, oral doses of lactulose reach the colon virtually unchanged. In the colon, lactulose is broken down primarily to lactic acid, and also to small amounts of formic and acetic acids, by the action of colonic bacteria, which results in an increase in osmotic pressure and slight acidification of the colonic contents. This in turn causes an increase in stool water content and softens the stool.

Since lactulose does not exert its effect until it reaches the colon, and since transit time through the colon may be slow, 24 to 48 hours may be required to produce the desired bowel movement.

Lactulose given orally to man and experimental animals resulted in only small amounts reaching the blood. Urinary excretion has been determined to be 3% or less and is essentially complete within 24 hours.

INDICATIONS AND USAGE

For the treatment of constipation. In patients with a history of chronic constipation, lactulose solution therapy increases the number of bowel movements per day and the number of days on which bowel movements occur.

CONTRAINDICATIONS

Since lactulose solution contains galactose (less than 1.6 g/15 mL), it is contraindicated in patients who require a low galactose diet.

WARNINGS

A theoretical hazard may exist for patients being treated with lactulose solution who may be required to undergo electrocautery procedures during proctoscopy or colonoscopy. Accumulation of H_2 gas in significant concentration in the presence of an electrical spark may result in an explosive reaction. Although this complication has not been reported with lactulose, patients on lactulose therapy undergoing such procedures should have a thorough bowel cleansing with a non-fermentable solution. Insufflation of CO_2 as an additional safeguard may be pursued but is considered to be a redundant measure.

PRECAUTIONS

General

Since lactulose solution contains galactose (less than 1.6 g/15 mL) and lactose (less than 1.2 g/15 mL), it should be used with caution in diabetics.

before such drugs are given concomitantly with lactulose solution.

Carcinogenesis, Mutagenesis, Impairment of Fertility

There are no known human data on long-term potential for carcinogenicity, mutagenicity, or impairment of fertility.

There are no known animal data on long-term potential for mutagenicity.

Administration of lactulose solution in the diet of mice for 18 months in concentrations of 3 and 10 percent (v/w) did not produce any evidence of carcinogenicity.

In studies in mice, rats, and rabbits, doses of lactulose solution up to 6 or 12 mL/kg/day produced no deleterious effects in breeding, conception, or parturition.

Pregnancy

Teratogenic Effects

Reproduction studies have been performed in mice, rats, and rabbits at doses up to 3 or 6 times the usual human oral dose and have revealed no evidence of impaired fertility or harm to the fetus due to lactulose. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when lactulose solution is administered to a nursing woman.

Pediatric Use

Safety and effectiveness in pediatric patients have not been established.

ADVERSE REACTIONS

Precise frequency data are not available.

Initial dosing may produce flatulence and intestinal cramps, which are usually transient. Excessive dosage can lead to diarrhea with potential complications such as loss of fluids, hypokalemia, and hypernatremia.

Nausea and vomiting have been reported.

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OVERDOSAGE

Signs and Symptoms

There have been no reports of accidental overdosage. In the event of overdosage, it is expected that diarrhea and abdominal cramps would be the major symptoms. Medication should be terminated.

Oral LD₅₀

The acute oral LD $_{50}$ of the drug is 48.8 mL/kg in mice and greater than 30 mL/kg in rats.

Dialysis

Dialysis data are not available for lactulose. Its molecular similarity to sucrose, however, would suggest that it should be dialyzable.

DOSAGE AND ADMINISTRATION

The usual dose is 1 to 2 tablespoonfuls (15 to 30 mL, containing 10 g to 20 g of lactulose) daily. The dose may be increased to 60 mL daily if necessary. Twenty-four to 48 hours may be required to produce a normal bowel movement.

NOTE: Some patients have found that lactulose solution may be more acceptable when mixed with fruit juice, water, or milk.

HOW SUPPLIED

Lactulose Solution, USP 10 g/15 mL is a colorless to yellow, unflavored solution available in the following container sizes:

15 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-15)

30 mL unit dose white cups in trays of 10 cups (NDC 0116-4005-30)

8 fl. oz. (237 mL) white bottles (NDC 0116-4005-08)

16 fl. oz. (473 mL) white bottles (NDC 0116-4005-16)

32 fl. oz. (946 mL) white bottles (NDC 0116-4005-32))

Lactulose solution contains lactulose 667 mg/mL (10 g/15 mL).

Store at 20 ° to 25 °C (68 ° to 77 °F) [see USP Controlled Room Temperature]. Do not freeze.

Under recommended storage conditions, a normal darkening of color may occur. Such darkening is characteristic of sugar solutions and does not affect therapeutic action.

Prolonged exposure to temperatures above 30 °C (86 °F) or to direct light may cause extreme darkening and turbidity which may be pharmaceutically objectionable. If this condition develops, do not use.

Prolonged exposure to freezing temperatures may cause change to a semisolid, too viscous to pour. Viscosity will return to normal upon warming to room temperature.

Dispense in original container or in a tight, light-resistant container as defined in the USP, with a child-resistant closure.

To The Pharmacist: When ordering this product, include the product number (or NDC) in the description.

Rx Only

Revised: October 2021

Distributed by:

Xttrium Laboratories, Inc. 1200 E. Business Center Dr. Mount Prospect, IL 60056

4005XTTINST

LACTULOSE

lactulose solution

Product Information				
Product Type	HUMAN PRESCRIPTION DRUG	Item Code (Source)	NDC:0116-4005	
Route of Administration	ORAL			

Active Ingredient/Active Moiety				
Ingredient Name	Basis of Strength	Strength		
LACTULOSE (UNII: 9U7D5QH5AE) (LACTULOSE - UNII:9U7D5QH5AE)	LACTULOSE	10 g in 15 mL		

Inactive Ingredients			
Ingredient Name	Strength		
D&C YELLOW NO. 10 (UNII: 35SW5USQ3G)			
WATER (UNII: 059QF0KO0R)			
FD&C YELLOW NO. 6 (UNII: H77VEI93A8)			

Product Characteristics			
Color	yellow (Colorless to yellow)	Score	
Shape		Size	
Flavor		Imprint Code	
Contains			

Packaging				
#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:0116- 4005-08	237 mL in 1 BOTTLE; Type 0: Not a Combination Product	07/01/2022	
2	NDC:0116- 4005-16	473 mL in 1 BOTTLE; Type 0: Not a Combination Product	07/01/2022	
3	NDC:0116- 4005-32	946 mL in 1 BOTTLE; Type 0: Not a Combination Product	07/01/2022	
4	NDC:0116- 4005-10	100 in 1 CASE	07/01/2022	
4	NDC:0116- 4005-40	40 in 1 CASE		
4		10 in 1 TRAY		
4	NDC:0116- 4005-15	15 mL in 1 CUP, UNIT-DOSE; Type 0: Not a Combination Product		
5	NDC:0116- 4005-11	100 in 1 CASE	07/01/2022	
5	NDC:0116- 4005-41	40 in 1 CASE		
5		10 in 1 TRAY		
5	NDC:0116- 4005-30	30 mL in 1 CUP, UNIT-DOSE; Type 0: Not a Combination Product		
6	NDC:0116- 4005-15	15 mL in 1 CUP, UNIT-DOSE; Type 0: Not a Combination Product	07/01/2022	
7	NDC:0116- 4005-30	30 mL in 1 CUP, UNIT-DOSE; Type 0: Not a Combination Product	07/01/2022	

Marketing Information			
Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
ANDA	ANDA075911	07/01/2022	

Labeler - Xttrium Laboratories, Inc. (007470579)

Registrant - Xttrium Laboratories, Inc. (007470579)

Establishment					
Name	Address	ID/FEI	Business Operations		
Xttrium Laboratories, Inc.		007470579	manufacture(0116-4005)		

Revised: 3/2023 Xttrium Laboratories, Inc.