

Famotidine is also indicated for the short term treatment of esophagitis due to GERD including erosive or ulcerative disease diagnosed by endoscopy (see CLINICAL PHARMACOLOGY IN ADULTS, *Clinical Studies*).

5. Treatment of pathological hypersecretory conditions (e.g., Zollinger-Ellison Syndrome, multiple endocrine adenomas) (see CLINICAL PHARMACOLOGY IN ADULTS, *Clinical Studies*).

CONTRAINDICATIONS

Hypersensitivity to any component of these products. Cross sensitivity in this class of compounds has been observed. Therefore, famotidine should not be administered to patients with a history of hypersensitivity to other H₂-receptor antagonists.

PRECAUTIONS

General

Symptomatic response to therapy with famotidine does not preclude the presence of gastric malignancy.

Patients with Moderate or Severe Renal Insufficiency

Since CNS adverse effects have been reported in patients with moderate and severe renal insufficiency, longer intervals between doses or lower doses may need to be used in patients with moderate (creatinine clearance <50 mL/min) or severe (creatinine clearance <10 mL/min) renal insufficiency to adjust for the longer elimination half-life of famotidine (see CLINICAL PHARMACOLOGY IN ADULTS and DOSAGE AND ADMINISTRATION). Prolonged QT interval has been reported very rarely in patients with impaired renal function whose dose/dosing interval of famotidine may not have been adjusted appropriately.

Drug Interactions

No drug interactions have been identified. Studies with famotidine in man, in animal models, and *in vitro* have shown no significant interference with the disposition of compounds metabolized by the hepatic microsomal enzymes, e.g., cytochrome P450 system. Compounds tested in man include warfarin, theophylline, phenytoin, diazepam, aminopyrine and antipyrine. Indocyanine green as an index of hepatic drug extraction has been tested and no significant effects have been found.

Carcinogenesis, Mutagenesis, Impairment of Fertility

In a 106 week study in rats and a 92 week study in mice given oral doses of up to 2000 mg/kg/day (approximately 2500 times the recommended human dose for active duodenal ulcer), there was no evidence of carcinogenic potential for famotidine.

Famotidine was negative in the microbial mutagen test (Ames test) using *Salmonella typhimurium* and *Escherichia coli* with or without rat liver enzyme activation at concentrations up to 10,000 mcg/plate. In *in vivo* studies in mice, with a micronucleus test and a chromosomal aberration test, no evidence of a mutagenic effect was observed.

In studies with rats given oral doses of up to 2000 mg/kg/day or intravenous doses of up to 200 mg/kg/day, fertility and reproductive performance were not affected.

Pregnancy

Pregnancy Category B

Reproductive studies have been performed in rats and rabbits at oral doses of up to 2000 and 500 mg/kg/day, respectively and in both species at I.V. doses of up to 200 mg/kg/day, and have revealed no significant evidence of impaired fertility or harm to the fetus due to famotidine. While no direct fetotoxic effects have been observed, sporadic abortions occurring only in mothers displaying marked decreased food intake were seen in some rabbits at oral doses of 200 mg/kg/ day (250 times the usual human dose) or higher. There are, however, no adequate or well-controlled studies in pregnant women. Because animal reproductive studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers

Studies performed in lactating rats have shown that famotidine is secreted into breast milk. Transient growth depression was observed in young rats suckling from mothers treated with maternotoxic doses of at least 600 times the usual human dose. Famotidine is detectable in human milk. Because of the potential for serious adverse reactions in nursing infants from famotidine, a decision should be made whether to discontinue nursing or discontinue the drug, taking into account the importance of the drug to the mother.

Pediatric Patients <1 year of age

Use of famotidine in pediatric patients <1 year of age is supported by evidence from adequate and well-controlled studies of famotidine in adults, and by the following studies in pediatric patients <1 year of age.

Two pharmacokinetic studies in pediatric patients <1 year of age (N=48) demonstrated that clearance of famotidine in patients >3 months to 1 year of age is similar to that seen in older pediatric patients (1-15 years of age) and adults. In contrast, pediatric patients 0-3 months of age had famotidine clearance values that were 2- to 4-fold less than those in older pediatric patients and adults. These studies also show that the mean bioavailability in pediatric patients <1 year of age after oral dosing is similar to older pediatric patients and adults. Pharmacodynamic data in pediatric patients 0-3 months of age suggest that the duration of acid suppression is longer compared with older pediatric patients, consistent with the longer famotidine half-life in pediatric patients 0-3 months of age. (See CLINICAL PHARMACOLOGY IN PEDIATRIC PATIENTS, *Pharmacokinetics* and *Pharmacodynamics*.)

In a double-blind, randomized, treatment-withdrawal study, 35 pediatric patients <1 year of age who were diagnosed as having gastroesophageal reflux disease were treated for up to 4 weeks with famotidine oral suspension (0.5 mg/kg/dose or 1 mg/kg/dose). Although an intravenous famotidine formulation was available, no patients were treated with intravenous famotidine in this study. Also, caregivers were instructed to provide conservative treatment including thickened feedings. Enrolled patients were diagnosed primarily by history of vomiting (spitting up) and irritability (fussiness). The famotidine dosing regimen was once daily for patients <3 months of age and twice daily for patients ≥3 months of age. After 4 weeks of treatment, patients were randomly withdrawn from the treatment and followed an additional 4 weeks for adverse events and symptomatology. Patients were evaluated for vomiting (spitting up), irritability (fussiness) and global assessments of improvement. The study patients ranged in age at entry from 1.3 to 10.5 months (mean 5.6 ± 2.9 months), 57% were female, 91% were white and 6% were black. Most patients (27/35) continued into the treatment-withdrawal phase of the study. Two patients discontinued famotidine due to adverse events. Most patients improved during the initial treatment phase of the study. Results of the treatment-withdrawal phase were difficult to interpret because of small numbers of patients. Of the 35 patients enrolled in the study, agitation was observed in 5 patients on famotidine that resolved when the medication was discontinued; agitation was not observed in patients on placebo (see ADVERSE REACTIONS, *Pediatric Patients*).

Pediatric Patients 1-16 years of age

Use of famotidine in pediatric patients 1-16 years of age is supported by evidence from adequate and well-controlled studies of famotidine in adults, and by the following studies in pediatric patients: In published studies in small numbers of pediatric patients 1-15 years of age, clearance of famotidine was similar to that seen in adults. In pediatric patients 11-15 years of age, oral doses of 0.5 mg/kg were associated with a mean area under the curve (AUC) similar to that seen in adults treated orally with 40 mg. Similarly, in pediatric patients 1-15 years of age, intravenous doses of 0.5 mg/kg were associated with a mean AUC similar to that seen in adults treated intravenously with 40 mg. Limited published studies also suggest that the relationship between serum concentration and acid suppression is similar in pediatric patients 1-15 years of age as compared with adults. These studies suggest a starting dose for pediatric patients 1-16 years of age as follows:

Peptic ulcer - - 0.5 mg/kg/day p.o. at bedtime or divided b.i.d. up to 40 mg/day.

Gastroesophageal Reflux Disease with or without esophagitis including erosions and ulcerations—1 mg/kg/day p.o. divided b.i.d. up to 40 mg b.i.d.

While published uncontrolled studies suggest effectiveness of famotidine in the treatment of gastroesophageal reflux disease and peptic ulcer, data in pediatric patients are insufficient to establish percent response with dose and duration of therapy. Therefore, treatment duration (initially based on adult duration recommendations) and dose should be individualized based on clinical response and/or pH determination (gastric or esophageal) and endoscopy. Published uncontrolled clinical studies in pediatric patients have employed doses up to 1 mg/kg/day for peptic ulcer and 2 mg/kg/day for GERD with or without esophagitis including erosions and ulcerations.

Geriatric Use

Of the 4,966 subjects in clinical studies who were treated with famotidine, 488 subjects (9.8%) were 65 and older, and 88 subjects (1.7%) were greater than 75 years of age. No overall differences in safety or effectiveness were observed between these subjects and younger subjects. However, greater sensitivity of some older individuals cannot be ruled out.

No dosage adjustment is required based on age (see CLINICAL PHARMACOLOGY IN ADULTS , *Pharmacokinetics*). This drug is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function. Dosage adjustment in the case of moderate or severe renal impairment is necessary (see PRECAUTIONS, *Patients with Moderate or Severe Renal Insufficiency* and DOSAGE AND ADMINISTRATION, *Dosage Adjustment for Patients with Moderate or Severe Renal Insufficiency*).

ADVERSE REACTIONS

The adverse reactions listed below have been reported during domestic and international clinical trials in approximately 2500 patients. In those controlled clinical trials in which famotidine tablets were compared to placebo, the incidence of adverse experiences in the group which received famotidine tablets, 40 mg at bedtime, was similar to that in the placebo group.

The following adverse reactions have been reported to occur in more than 1% of patients on therapy with famotidine in controlled clinical trials, and may be causally related to the drug: headache (4.7%), dizziness (1.3%), constipation (1.2%) and diarrhea (1.7%).

The following other adverse reactions have been reported infrequently in clinical trials or since the drug was marketed. The relationship to therapy with famotidine has been unclear in many cases. Within each category the adverse reactions are listed in order of decreasing severity:

Body as a Whole: fever, asthenia, fatigue

Cardiovascular: arrhythmia, AV block, palpitation. Prolonged QT interval, in patients with impaired renal function, has been reported very rarely.

Gastrointestinal: cholestatic/jaundice, hepatitis, liver enzyme abnormalities, vomiting, nausea, abdominal discomfort, anorexia, dry mouth

Hematologic: rare cases of agranulocytosis, pancytopenia, leukopenia, thrombocytopenia

Hypersensitivity: anaphylaxis, angioedema, orbital or facial edema, urticaria, rash, conjunctival injection

Musculoskeletal: musculoskeletal pain including muscle cramps, arthralgia

Nervous System/Psychiatric: grand mal seizure; psychic disturbances, which were reversible in cases for which follow-up was obtained, including hallucinations, confusion, agitation, depression, anxiety, decreased libido; paresthesia; insomnia; somnolence. Convulsions, in patients with impaired renal function, have been reported very rarely.

Respiratory: bronchospasm, interstitial pneumonia

Skin: toxic epidermal necrolysis/Stevens-Johnson syndrome (very rare), alopecia, acne, pruritus, dry skin, flushing

Special Senses: tinnitus, taste disorder

Other: rare cases of impotence and rare cases of gynecmastia have been reported; however, in controlled clinical trials, the incidences were not greater than those seen with placebo.

Pediatric Patients

In a clinical study in 35 pediatric patients <1 year of age with GERD symptoms [e.g., vomiting (spitting up), irritability (fussing)], agitation was observed in 5 patients on famotidine that resolved when the medication was discontinued.

OVERDOSAGE

The adverse reactions in overdose cases are similar to the adverse reactions encountered in normal clinical experience (see ADVERSE REACTIONS). Oral doses of up to 640 mg/day have been given to adult patients with pathological hypersecretory conditions with no serious adverse effects. In the event of overdosage, treatment should be symptomatic and supportive. Unabsorbed material should be removed from the gastrointestinal tract, the patient should be monitored, and supportive therapy should be employed.

The oral LD₅₀ of famotidine in male and female rats and mice was greater than 3000 mg/kg and the minimum lethal acute oral dose in dogs exceeded 2000 mg/kg. Famotidine did not produce overt effects at high oral doses in mice, rats, cats and dogs, but induced significant anorexia and growth depression in rabbits starting with 200 mg/kg/day orally. The intravenous LD₅₀ of famotidine for mice and rats ranged from 254-563 mg/kg and the minimum lethal single I.V. dose in dogs was approximately 300 mg/kg. Signs of acute intoxication in I.V. treated dogs were emesis, restlessness, pallor of mucous membranes or redness of mouth and ears, hypotension, tachycardia and collapse.

DOSAGE AND ADMINISTRATION

Duodenal Ulcer

Acute Therapy: The recommended adult oral dosage for active duodenal ulcer is 40 mg once a day at bedtime. Most patients heal within 4 weeks; there is rarely reason to use famotidine at full dosage for longer than 6 to 8 weeks. A regimen of 20 mg b.i.d. is also effective.

Maintenance Therapy: The recommended adult oral dose is 20 mg once a day at bedtime.

Benign Gastric Ulcer

Acute Therapy: The recommended adult oral dosage for active benign gastric ulcer is 40 mg once a day at bedtime.

Gastroesophageal Reflux Disease (GERD)

The recommended oral dosage for treatment of adult patients with symptoms of GERD is 20 mg b.i.d. for up to 6 weeks. The recommended oral dosage for the treatment of adult patients with esophagitis including erosions and ulcerations and accompanying symptoms due to GERD is 20 or 40 mg b.i.d. for up to 12 weeks (see CLINICAL PHARMACOLOGY IN ADULTS, *Clinical Studies*).

Dosage for Pediatric Patients <1 year of age Gastroesophageal Reflux Disease (GERD)

See PRECAUTIONS , *Pediatric Patients <1 year of age*.

The studies described in PRECAUTIONS , *Pediatric Patients <1 year of age* suggest the following starting doses in pediatric patients <1 year of age: *Gastroesophageal Reflux Disease (GERD)* - 0.5 mg/kg/dose of famotidine oral suspension for the treatment of GERD for up to 8 weeks once daily in patients <3 months of age and 0.5 mg/kg/dose twice daily in patients 3 months to <1 year of age. Patients should also be receiving conservative measures (e.g., thickened feedings). The use of intravenous famotidine in pediatric patients <1 year of age with GERD has not been adequately studied.

Dosage for Pediatric Patients 1-16 years of age

See PRECAUTIONS , *Pediatric Patients 1-16 years of age* .

The studies described in PRECAUTIONS , *Pediatric Patients 1-16 years of age* suggest the following starting doses in pediatric patients 1-16 years of age:

Peptic ulcer — 0.5 mg/kg/day p.o. at bedtime or divided b.i.d. up to 40 mg/day.

Gastroesophageal Reflux Disease with or without esophagitis including erosions and ulcerations—1.0 mg/kg/day p.o. divided b.i.d. up to 40 mg b.i.d.

While published uncontrolled studies suggest effectiveness of famotidine in the treatment of gastroesophageal reflux disease and peptic ulcer, data in pediatric patients are insufficient to establish percent response with dose and duration of therapy. Therefore, treatment duration (initially based on adult duration recommendations) and dose should be individualized based on clinical response and/or pH determination (gastric or esophageal) and endoscopy. Published uncontrolled clinical studies in pediatric patients 1-16 years of age have employed doses up to 1 mg/kg/day for peptic ulcer and 2 mg/kg/day for GERD with or without esophagitis including erosions and ulcerations.

Pathological Hypersecretory Conditions (e.g., Zollinger-Ellison Syndrome, Multiple Endocrine Adenomas)

The dosage of famotidine in patients with pathological hypersecretory conditions varies with the individual patient. The recommended adult oral starting dose for pathological hypersecretory conditions is 20 mg q 6 h. In some patients, a higher starting dose may be required. Doses should be adjusted to individual patient needs and should continue as long as clinically indicated. Doses up to 160 mg q 6 h have been administered to some adult patients with severe Zollinger-Ellison Syndrome.

Concomitant Use of Antacids

Antacids may be given concomitantly if needed.

Dosage Adjustment for Patients with Moderate or Severe Renal Insufficiency

In adult patients with moderate (creatinine clearance <50 mL/min) or severe (creatinine clearance <10 mL/min) renal insufficiency, the elimination half-life of famotidine is increased. For patients with severe renal insufficiency, it may exceed 20 hours, reaching approximately 24 hours in anuric patients. Since CNS adverse effects have been reported in patients with moderate and severe renal insufficiency, to avoid excess accumulation of the drug in patients with moderate or severe renal insufficiency, the dose of famotidine may be reduced to half the dose or the dosing interval may be prolonged to 36-48 hours as indicated by the patient's clinical response.

Based on the comparison of pharmacokinetic parameters for famotidine in adults and pediatric patients, dosage adjustment in pediatric patients with moderate or severe renal insufficiency should be considered.

HOW SUPPLIED

Famotidine Tablets USP (white round tablets) containing 20mg of famotidine and engraved with CT1

Bottle of 30	(NDC 61442-121-30)
Bottle of 100	(NDC 61442-121-01)
Bottle of 500	(NDC 61442-121-05)
Bottle of 1,000	(NDC 61442-121-10)

Famotidine Tablets USP (white round tablets) containing 40mg of famotidine and engraved with CT2

Bottle of 30	(NDC 61442-122-30)
Bottle of 100	(NDC 61442-122-01)
Bottle of 500	(NDC 61442-122-05)
Bottle of 1,000	(NDC 61442-122-10)

STORAGE

Store at 20° to 25°C (68° to 77°F). [See USP Controlled Room Temperature.]

Manufactured and Distributed by:

Carlsbad Technology, Inc.
Carlsbad, CA 92008

Revised: 06/12

CTI-12 Rev. C