Vitamins & More

Amino Acids - L-Carnitine

Indications

L-carnitine is a chemical that is made in the human brain, liver, and kidneys. It helps the body turn fat into energy.

L-carnitine is important for heart and brain function, muscle movement, and many other body processes. The body can convert L-carnitine to other chemicals called acetyl-L-carnitine and propionyl-L-carnitine. But it's not clear whether the benefits of these other carnitines are the same.

Can reduce chest pain
Build up fluid in the body from congestive heart failure
Reduce high levels of cholesterol or fat in the body
FDA approved by IV for kidney failure
Male infertility by increasing sperm count
Female infertility associated with polycystic ovarian syndrome
Facilitate weight loss
Improve blood sugar levels
May improve brain function
May improve exercise recovery by increasing oxygen supply to muscles
May improve stamina with increased blood flow and nitric oxide production which delays discomfort and reduces fatigue
May reduce muscle soreness after exercise

Deficiency

Symptoms of carnitine deficiency and the age at which symptoms appear depend on the cause. Carnitine deficiency may cause muscle necrosis, myoglobinuria, lipid-storage myopathy, hypoglycemia, fatty liver, and hyperammonemia with muscle aches, fatigue, confusion, and cardiomyopathy.

Toxicity

At doses of approximately 3 g/day, carnitine supplements can cause nausea, vomiting, abdominal cramps, diarrhea, and a “fishy” body odor [1,2]. Rarer side effects include muscle weakness in uremic patients and seizures in those with seizure disorders.

Contraindications/Precautions

Hypersensitivity Reactions

Serious hypersensitivity reactions, including anaphylaxis, laryngeal edema, and bronchospasm have been reported following L-Carnitine administration, mostly in patients with end stage renal disease who are undergoing dialysis. Some reactions occurred within minutes after intravenous administration of L-Carnitine.

If a severe hypersensitivity reaction occurs, discontinue L-Carnitine treatment and initiate appropriate medical treatment. Consider the risks and benefits of re-administering L-Carnitine to individual patients following a severe reaction. If the decision is made to re-administer the product, monitor patients for a recurrence of signs and symptoms of a severe hypersensitivity reaction.

The safety and efficacy of oral L-Carnitine has not been evaluated in patients with renal insufficiency. Chronic administration of high doses of oral levocarnitine in patients with severely compromised renal function or in ESRD patients on dialysis may result in accumulation of the potentially toxic metabolites, trimethylamine (TMA) and trimethylamine-N-oxide (TMAO), since these metabolites are normally excreted in the urine.

Reproductive studies have been performed in rats and rabbits at doses up to 3.8 times the human dose on the basis of surface area and have revealed no evidence of impaired fertility or harm to the fetus due to L-Carnitine. There are, however, no adequate and well controlled studies in pregnant women.

Transient nausea and vomiting have been observed. Less frequent adverse reactions are body odor, nausea, and gastritis.

Neurologic Reactions: Seizures have been reported to occur in patients, with or without pre-existing seizure activity, receiving either oral or intravenous L-Carnitine. In patients with pre-existing seizure activity, an increase in seizure frequency and/or severity has been reported. Hypersensitivity reactions: Anaphylaxis, laryngeal edema and bronchospasm

Dosing/Administration

The recommended dose is 50 mg/kg given as a slow 2-3 minute bolus injection or by infusion.

Vitamin B12

(Cyanocobalamin, methylcobalamin, hydroxycolamine)

Indications

Boosts red blood cell count
Reduces fatigue
Aids in immune system function
Improves mood
Enhances focus
Improves memory and cognition

Deficiency

Unsteady gait, chronic fatigue, constipation, depression, digestive disturbances, dizziness, drowsiness, liver enlargement, hallucinations, headaches, inflammation of tongue, irritability, mood swings, nerve disorders, palpitations, pernicious anemia, tinnitus, spinal cord degeneration

Toxicity

Water soluble vitamin, no known toxic dose. In life-threatening cases of cyanide toxicity, 5,000,000µg of B12 is injected. Blood levels quickly rise to 560,000,000pmol/L, and if necessary, treatment is repeated within hours for a total of 10,000,000µg of B12. This is more than **4 million times** the recommended daily intake, yet still there are no B12 toxicity symptoms outside of a few harmless and temporary effects, such as red skin and faster heart rate

Contraindications/Precautions

Allergy or sensitivity to cobalt or cobalamin: Do not use vitamin B12 if you have this condition.
Leber's disease, a hereditary eye disease: Do not take vitamin B12 if you have this disease. It can seriously harm the optic nerve, which might lead to blindness.
Abnormal red blood cells.

Megaloblastic anemia is sometimes corrected by treatment with vitamin B12. However, this can have very serious side effects. Don't attempt vitamin B12 therapy without close supervision by a healthcare provider.

Dosing/Administration

Dosing recommendation for injectable vitamin B12 includes 1000 mcg daily for 7-10 days followed by 1000 mcg weekly for 1 month followed by 1000 mcg monthly for life.

Vitamin B Complex

Indications

B complex 100 injection is mainly used for individuals with fever, severe burn, pregnancy, increased metabolism, impaired digestive tract, prolonged diseases, gastrointestinal disorders, alcoholism and various other B vitamin deficiency. Vitamin B injections are mostly used by athletes, children, vegetarians and adults over the age of 50.

Vitamin B complex injection is also used by many individuals for an immediate boost in energy. These injections are most useful for fatigue caused due to nerve damage, diabetes, sciatica, tinnitus, effects of stress, chronic disease, B12 deficiency and a number of other conditions.

Certain conditions, such as Crohn's disease, Celiac disease, HIV, and alcohol use disorder can prevent the body from absorbing B vitamins effectively, increasing the risk for deficiencies.

Deficiency

Symptoms depend on which vitamin is lacking.
B1 (Thiamine) - appetite, weight loss, nausea, vomiting, fatigue
B2 (Riboflavin) - cracks, sores on tongue, red eyes, skin lesions, dizziness, hair loss, insomnia
B3 (Niacin) - Canker sores, diarrhea, dizziness, fatigue, headaches, insomnia, loss of appetite
B5 (Pantothenic Acid) - nausea, vomiting, fatigue, headache, tingling in hands, muscle weakness
B6 (Pyridoxine) - anemia, headache, nausea, flaky skin, sore tongue, insomnia, weakness
B7 (Biotin) - dermatitis, hair loss, fatigue, muscle atrophy, elevated glucose and cholesterol
B9 (Folate) - anemia, irritability, weakness, sleep disturbance, pallor, sore tongue
B12 (Cobalamin) - unsteady gait, fatigue, constipation, depression, digestive disturbances, headaches

Toxicity

Because vitamin B complex vitamins are water soluble, they are not stored in our body and typically an overdose is not a concern. However, side effects of very large doses of any particular vitamin or supplement can occur.

For example, starting a Niacin (B3) supplement can cause flushing of the skin, and pantothenic acid (B5) can cause an upset stomach.

Contraindications/Precautions

Anaphylactogenesis may occur with parenteral thiamine. Use with caution. An intradermal test dose is recommended prior to administration in patients suspected of being sensitive to the drug.

The usual precautions for parenteral administration should be observed. Do not inject if precipitation occurs. Inject slowly by the intravenous route. High concentrations should be diluted using Normal Saline Injection when given intravenously.

Mild transient diarrhea, polycythemia vera, peripheral vascular thrombosis, itching transitory exanthema, feeling of swelling of entire body, anaphylactic shock and death. Sensitivity to the ingredients listed may occur. Use should be discontinued upon observance of any untoward reaction. Pain upon intramuscular injection may be noted.

https://www.drugs.com/pro/vitamin-b-complex.html#s-34068-7

Dosing/Administration

Mixture x 3mL = Thiamine Hydrochloride 300 mg, Riboflavin 5' Phosphate Sodium 6 mg, Pyridoxine Hydrochloride 6 mg, Dexpanthenol 6 mg, Niacinamide 300 mg. Usually 0.25 to 2 mL by intramuscular or slow intravenous injection. High concentrations given intravenously may be diluted using parenteral infusion solutions.

Biotin

Indications

Biotin has been used to treat male pattern baldness and has been an ingredient in hair- and skin-conditioning products, although evidence to support its use in the prevention of hair loss or in brittle nails is lacking. Limited clinical studies have evaluated the effects of supplemental biotin in diabetes, with high doses used in multiple sclerosis, as well.

Deficiency

Dermatitis, hair loss, fatigue, muscle atrophy, elevated glucose and cholesterol

Toxicity

This vitamin is water soluble and generally considered non toxic. Biotin is a safe and nontoxic vitamin that the body excretes when in excess.

Contraindications/Precautions

When taking anticonvulsants such as carbamazepine or phenobarbital, the requirements for biotin increase due to these medications inhibiting uptake into the brush borders of membrane vesicles. Biotin can interfere with some hormone assays. In immunoassays using the streptavidin-biotin interaction, the interference may induce both false-positive and false-negative results. The hormone levels affected may include thyroid functions, gonadotrophins, and vitamin D.

There are no evident contraindications to taking this vitamin.
https://www.ncbi.nlm.nih.gov/books/NBK554493/

Dosing/Administration

Biotin appears to be widely protein-bound. Recommendations for biotin intake range from 5 mcg to 35 mcg per day, depending on circumstances. For example, there is no daily recommendation, but biotin use may be appropriate and warranted for a breastfeeding mother due to increased demand for nutrients. If a patient is taking biotin and smoking, they may require increased doses due to increased biotin metabolism.

Calcium Chloride

Indications

Hypocalcemia

Deficiency

Muscle spasms, rickets, osteomalacia, osteoporosis, irregular heartbeat, and tingling in the hands and mouth

Toxicity

There are many signs of hypercalcemia, such as increased thirst, increased urination, tachycardia and heart palpitations. Additionally, the patient may experience alterations in mental status.

Contraindications/Precautions

Calcium chloride is contraindicated for cardiac resuscitation in the presence of ventricular fibrillation or in patients with the risk of existing digitalis toxicity.

Calcium chloride is not recommended in the treatment of asystole and electromechanical dissociation.

10% Calcium Chloride Injection, USP is irritating to veins and must not be injected into tissues, since severe necrosis and sloughing may occur. Great care should be taken to avoid extravasation or accidental injection into perivascular tissues.
Because of its additive effect, calcium should be administered very cautiously to a patient who is digitalized or who is taking effective doses of digitalis or digitalis-like preparations.

Injections should be made slowly through a small needle into a large vein to minimize venous irritation and avoid undesirable reactions. It is particularly important to prevent a high concentration of calcium from reaching the heart because of the danger of cardiac syncope.

Rapid injection may cause the patient to complain of tingling sensations, a calcium taste, a sense of oppression or “heat wave”.

Injections of calcium chloride are accompanied by peripheral vasodilatation as well as a local “burning” sensation and there may be a moderate fall in blood pressure.
Should perivascular infiltration occur, I.V. administration at that site should be discontinued at once.

Local infiltration of the affected area with 1% procaine hydrochloride, to which hyaluronidase may be added, will often reduce venospasm and dilute the calcium remaining in the tissues locally. Local application of heat may also be helpful.

https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/021117s015lbl.pdf

Dosing/Administration

100mg/mL x 1mL = 100mg
The usual adult dosage in hypocalcemic disorders ranges from 200 mg to 1 g (2 −10 mL) at intervals of 1 to 3 days depending on the response of the patient and/or results of serum ionized calcium determinations.

Folic Acid

Indications

Elderly people who live single or institutionalized. After 65 years of age we have less capacity to absorb this vitamin
Pregnant or nursing mothers
People who smoke
People who drink habitually
People with intestinal issues

Inflammatory arthritis
People on contraceptive pills

Deficiency

Anemia, irritability, weakness, sleep disturbances, pallor, sore and reddened tongue

Toxicity

This vitamin is water soluble. The upper limit for folate intake is 1000 mcg; higher daily doses (up to 4 mg) are recommended for women who have had a baby with a neural tube defect. Folate is essentially nontoxic.

Contraindications/Precautions

None

Dosing/Administration

In adults and children (regardless of age): up to 1 mg daily. Resistant cases may require larger doses.

Glutathione

Indications

Cardiovascular disease
Neurodegenerative disease
Male infertility
Non Alcoholic fatty liver disease

Deficiency

A study of community-based elderly patients found that increased glutathione levels were associated with higher levels of self-rated health, fewer illnesses, and reduced cholesterol, body mass index, and blood pressure.Julius 1994 Depletion of glutathione has been linked to neuroinflammation; neurodegeneration; infection; cancer; and diseases such as Alzheimer disease, Parkinson disease, HIV, cystic fibrosis, periodontitis, diabetes, schizophrenia, and bipolar disorder, among others. However, while levels of glutathione are often reported to be low in neurodegenerative diseases, causality has not been directly attributed to glutathione. Depletion of glutathione is also a part of the aging process.

Toxicity

Glutathione has received "generally recognized as safe" (GRAS) status. Increased flatulence and loose stools, flushing, and weight gain were reported in one study. A case report shows reversible, severe hepatic injury related to use of IV glutathione, and inhaled glutathione may exacerbate asthma.

Contraindications/Precautions

Information regarding drug interactions is lacking; however, glutathione is likely to interact with chemotherapeutic agents, and concomitant use is theoretically contraindicated.Balendiran 2004, Ballatori 2009 Acetaminophen in high doses is known to deplete glutathione, especially in the liver.

IV glutathione 1,400 mg given 3 times per week for 4 weeks was well tolerated in a small (N=21) clinical study Hauser 2009; however, a case report shows reversible, severe hepatic injury related to IV glutathione 1,200 mg given daily, for a cumulative dose of 36,000 mg in 1 month.Naito 2010

Dosing/Administration

200 mg/mL. Administration of glutathione should be given by itself. Give slow IVP flushing the line before and after or in IV fluids with no other medications. Do NOT mix glutathione with other medications. Glutathione and Ascorbic Acid may interact if administered together. (https://www.consultdranderson.com/separating-intravenous-ascorbic-acid-and-glutathione/)

Magnesium

Indications

Magnesium is required for the proper growth and maintenance of bones. Magnesium is also required for the proper function of nerves, muscles, and many other parts of the body. In the stomach, magnesium helps neutralize stomach acid and moves stools through the intestine.

Deficiency

Magnesium plays a vital role in how our bodies function and stay healthy. The human body contains about 25 grams of magnesium. 50 to 60 percent are in the skeletal system, while the rest are found in muscles, soft tissues, and bodily fluids.

- Fatigue and Muscle Weakness
- Asthma
- High Blood Pressure
- Muscle Cramps and Spasms
- Stress
- Ringing in the Ears
- Eye Twitching
- Headaches and Migraines
- Loss Of Appetite
- Anxiety and Depression
- Insomnia

Toxicity

As magnesium levels rise, different symptoms start to manifest, and the fatality of those symptoms is proportional to the levels of magnesium found. Starting at 5 to 10 mEq/L, patients will begin to develop ECG changes (prolonged PR interval, widened QRS). At 10 mEq/L, there will be a loss of deep tendon reflexes and muscle weakness. At 15 mEq/L, signs of abnormal conductivity surface as SA/AV node block. Additionally, patients begin to experience respiratory paralysis. At 20 mEq/L or higher, the patient is likely to experience cardiac arrest.

Contraindications/Precautions

Magnesium Chloride Injection should not be administered if there is renal impairment, marked myocardial disease or to comatose patients. The usual precautions for parenteral administration should be observed. Administer with caution if flushing and sweating occurs. A preparation of a calcium salt should be readily available for intravenous injection to counteract potential serious signs of magnesium intoxication. As long as deep tendon reflexes are active it is probable that the patient will not develop respiratory paralysis. Respiration and blood pressure should be carefully observed during and after administration of Magnesium Chloride Injection.

Monitor for adverse effects such as flushing, sweating, sharply lowered blood pressure, hypothermia, stupor and ultimately respiratory depression.

Dosing/Administration

For intravenous infusion: 4 grams in 250 mL of 5% Dextrose Injection, at a rate not exceeding 3 mL per minute. Serum magnesium levels should serve as a guide to continued dosage.

Ketorolac/Toradol

Indications

Ketorolac tromethamine is a nonsteroidal anti-inflammatory drug (NSAID). Ketorolac tromethamine injection may be used as a single or multiple dose on a regular or “prn” schedule for the management of moderately severe, acute pain that requires analgesia at the opioid level, usually in a postoperative setting. Hypovolemia should be corrected prior to the administration of ketorolac tromethamine. Patients should be switched to alternative analgesics as soon as possible, but ketorolac tromethamine therapy is not to exceed 5 days.

Deficiency

None

Toxicity

Hives, difficult breathing, swelling in your face or throat or a severe skin reaction (fever, sore throat, burning in your eyes, skin pain, red or purple skin rash that spreads and causes blistering and peeling).

Contraindications/Precautions

CARDIOVASCULAR THROMBOTIC EVENTS
Nonsteroidal anti-inflammatory drugs (NSAIDs) cause an increased risk of serious cardiovascular thrombotic events, including myocardial infarction and stroke, which can be fatal. This risk may occur early in treatment and may increase with duration of use.
Ketorolac tromethamine is CONTRAINDICATED in the setting of coronary artery bypass graft (CABG) surgery.

RENAL RISK
Ketorolac tromethamine is CONTRAINDICATED in patients with advanced renal impairment and in patients at risk for renal failure due to volume depletion.

RISK OF BLEEDING
Ketorolac tromethamine inhibits platelet function and is, therefore, CONTRAINDICATED in patients with suspected or confirmed cerebrovascular bleeding, patients with hemorrhagic diathesis, incomplete hemostasis and those at high risk of bleeding.

HYPERSENSITIVITY
Hypersensitivity reactions, ranging from bronchospasm to anaphylactic shock, have occurred and appropriate counteractive measures must be available when administering the first dose of ketorolac tromethamine injection. Ketorolac tromethamine is CONTRAINDICATED in patients with previously demonstrated hypersensitivity to ketorolac

tromethamine or allergic manifestations to aspirin or other nonsteroidal anti-inflammatory drugs (NSAIDs).

RISK DURING LABOR AND DELIVERY
The use of ketorolac tromethamine in labor and delivery is CONTRAINDICATED because it may adversely affect fetal circulation and inhibit uterine contractions.

CONCOMITANT USE WITH NSAIDS
Ketorolac tromethamine is CONTRAINDICATED in patients currently receiving aspirin or NSAIDs because of the cumulative risk of inducing serious NSAID-related side effects.

SPECIAL POPULATIONS
Dosage should be adjusted for patients 65 years or older, for patients under 50 kg (110 lbs.) of body weight and for patients with moderately elevated serum creatinine. Doses of ketorolac tromethamine injection are not to exceed 60 mg (total dose per day) in these patients.

https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=62591551-a644-4b2c-a0de-982e906fabc3#s25

Dosing/Administration

When administering ketorolac tromethamine injection, the IV bolus must be given over no less than 15 seconds. The IM administration should be given slowly and deeply into the muscle. The analgesic effect begins in ~30 minutes with maximum effect in 1 to 2 hours after dosing IV or IM. Duration of analgesic effect is usually 4 to 6 hours.

Tri-Amino Acids (L-Ornithine 100 mg/mL, L-Arginine 100 mg/mL, L-Citrulline 100 mg/mL)

Indications

Together, these amino acids can help promote the production of nitric oxide (NO), which has many positive effects.

Tri-Amino injections can also help encourage Human Growth Hormone (hGH) production, support athletic performance, influence metabolism and encourage fat loss.

Improved nitric oxide production which can impact wound healing and recovery as well as help manage conditions like CHF, heart disease, peripheral vascular disease and migraines

Improved sexual function and cardiovascular health.

Deficiency

Infections, loss of muscle mass, and skin/hair/nail issues

Toxicity

Consuming too much protein or amino acids can put a strain on your kidneys, because amino acids can be metabolized and have potentially toxic byproducts

Contraindications/Precautions

Use caution if allergic to sulfites. This medicine may contain aluminum. There is a chance of aluminum toxicity if you are on amino acid injection for a long time. The risk is greater if you have kidney problems. Adverse events are more common in patients 65 or older. Use amino acid injection with care.

Don't take this supplement if you are using nitrates to treat heart disease, any type of medicine for hypertension or ED drugs like sildenafil, tadalafil or vardenafil.

The combination of Tri-Amino Injection with these drugs could result in a dangerous drop in blood pressure.

Dosing/Administration

The dosage is based on amino acids/kg of body weight/day. In general, 1-3 mL administered as an IV infusion.

Vitamin C

Indications

Collagen formation
Bone and blood vessel health
Carnitine, hormone, and amino acid formation
Wound healing

Deficiency

Poor wound healing, bleeding gums, easy bruising, nosebleeds, joint pain, lack of energy, susceptibility to infection

Toxicity

Intake of vitamin C below the upper limit does not have toxic effects in healthy adults.
Even at high doses, vitamin C is not known to be toxic or to cause any serious adverse effects.
The most common side effects are diarrhea, nausea, abdominal cramps, and other gastrointestinal issues

Contraindications/Precautions

Oxalate nephropathy and Nephrolithiasis: Ascorbic acid has been associated with development of acute or chronic oxalate nephropathy following prolonged use of high doses of ascorbic acid infusion. Patients with renal disease including renal impairment, history of oxalate kidney stones, geriatric patients, and pediatric patients less than 2 years old may be at increased risk.

Hemolysis: Patients with glucose-6-phosphate dehydrogenase deficiency are at risk of severe hemolysis; a reduced dose is recommended.

Laboratory Test Interference: Ascorbic acid may interfere with laboratory tests based on oxidation-reduction reactions, including blood and urine glucose testing.

Most common adverse reactions are pain and swelling at the site of infusion.

Dosing/Administration

The largest recommended single dose is 200 mg. Minimize exposure to light because ascorbic acid is light sensitive. This solution must be diluted prior to IV infusion.

Zinc

Indications

Boost immune system
Help with wound healing
Reduce symptoms of diarrhea
Slow the progression of eye disease

Deficiency

Changes in ability to taste and smell, thin or peeling nails, acne, delayed sexual maturation, hair loss, elevated cholesterol, impaired night vision, impotence, growth retardation, susceptibility to infection

Toxicity

The recommended upper limit in adults for zinc intake is 40 mg/day; the upper limit is lower for younger people. Toxicity is rare.

Ingesting doses of elemental zinc ranging from 100 to 150 mg/day for prolonged periods interferes with copper metabolism and causes low blood copper levels, red blood cell microcytosis, neutropenia, and impaired immunity; higher doses should be given only for short periods of time and the patient followed closely.

Ingesting larger amounts (200 to 800 mg/day), usually by consuming acidic food or drinking from a galvanized (zinc-coated) container, can cause anorexia, vomiting, and diarrhea. Chronic toxicity may result in copper deficiency and may cause nerve damage.

Contraindications/Precautions

Known hypersensitivity to zinc.

WARNINGS AND PRECAUTIONS
Pulmonary Embolism due to Pulmonary Vascular Precipitates: If signs of pulmonary distress occur, stop the infusion and initiate a medical evaluation.

Vein Damage and Thrombosis: Solutions with osmolarity of 900 mOsmol/L or more must be infused through a central catheter.

Aluminum Toxicity: Possible increased risk in patients with renal impairment, including preterm infants.

Monitoring and Laboratory Tests: Monitor fluid and electrolyte status, serum osmolarity, blood glucose, liver and kidney function, blood count and coagulation parameters throughout treatment.

Copper Deficiency: If signs and symptoms develop, interrupt treatment with Zinc Sulfate Injection and check zinc, copper, and ceruloplasmin levels.

Hypersensitivity Reactions: If reactions occur, discontinue Zinc Sulfate Injection and initiate appropriate medical treatment.

ADVERSE REACTIONS
No zinc-related adverse reactions in patients receiving intravenously administered parenteral nutrition solutions containing zinc within the recommended dosage range.

https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=8f354f0a-4e10-4e4e-b86c-49d97cbd631d

Dosing/Administration

The recommended adult dosage is 3 mg/day for metabolically stable patients, with potential need for a higher daily dosage in monitored patients with small bowel fluid loss or excess stool or ileostomy output.

Zofran/Ondansetron

Indications

Nausea

Deficiency

None

Toxicity

Symptoms may include sudden loss of vision, severe constipation, feeling light-headed, or fainting.

Contraindications/Precautions

Patients known to have hypersensitivity (e.g., anaphylaxis) to this product or any of its components. Concomitant use of apomorphine.

Hypersensitivity Reactions: Hypersensitivity reactions, including anaphylaxis and bronchospasm have been reported in patients who have exhibited hypersensitivity to other selective 5-HT3 receptor antagonists.

QT Prolongation and Torsade de Pointes: QT prolongation occurs in a dose-dependent manner. Cases of Torsade de Pointes have been reported. Avoid ondansetron in patients with congenital long QT syndrome.

Serotonin Syndrome: Serotonin syndrome has been reported with 5-HT3 receptor agonists alone but particularly with concomitant use of serotonergic drugs.
Myocardial Ischemia: Do not exceed the recommended infusion rate and monitor patients during and after administration.

The most common adverse reactions (≥ 7%) in adults are diarrhea, headache, and fever.

https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=59c4227a-90b6-4297-aacd-05bd097010c1

Dosing/Administration

4mg/2mL x 2mL = 4mg (Anti-Nauseant)

Adults and pediatric patients 6 months of age and older: The recommended dosage is 0.15 mg/kg per dose for 3 doses (maximum of 16 mg per dose), infused intravenously over 15 minutes. Patients With Severe Hepatic Impairment: Do not exceed a total daily dose of 8 mg.