POTASSIUM SUPPLEMENTS (Systemic)

Category

Antihypokalemic; electrolyte replenisher.

**Indications**

Accepted

Hypokalemia (treatment)¾Potassium supplements are indicated in patients with hypokalemia, with or without metabolic alkalosis; 64 in chronic 25 digitalis intoxication; and in patients with hypokalemic familial periodic paralysis. 18 Potassium supplementation is indicated in severe hypokalemia in patients receiving potassium-wasting diuretics for uncomplicated essential hypertension, 42, 46 when dosage adjustment of the diuretic is ineffective or unwarranted. 15 Potassium supplementation may be needed in patients receiving antibiotics that cause potassium depletion, either by drug-induced nephrotoxicity (e.g., amphotericin B, 71 polymyxin B, or gentamicin 69, 70 ) or by a nonreabsorbable anion effect (e.g., azlocillin, carbenicillin, mezlocillin, penicillin, piperacillin, or ticarcillin 72 ). 64 Potassium chloride is usually the salt of choice in the treatment of hypokalemia, since it is better absorbed from the gastrointestinal tract than the nonchloride potassium salts, and the chloride ion may be required to correct hypochloremia, which often occurs with hypokalemia. 42 In rare circumstances (e.g., patients with renal tubular acidosis), potassium depletion may be associated with metabolic acidosis and hyperchloremia. In such patients, potassium replacement should be accomplished with potassium salts other than chloride, such as potassium acetate, potassium bicarbonate, potassium citrate, or potassium gluconate. 42

Hypokalemia (prophylaxis)¾Potassium supplements are indicated to prevent hypokalemia in patients who would be at particular risk if hypokalemia were to develop (e.g., digitalized patients with significant cardiac arrhythmias). Potassium depletion will occur when the rate of loss through renal excretion and/or loss from the gastrointestinal tract exceeds the rate of potassium intake. 14, 64 Potassium supplements may also be indicated in patients who suffer from hepatic cirrhosis with ascites; 42 states of aldosterone excess with normal renal function; 42, 64 certain diarrheal states, including those induced by chronic laxative use 42, 46 ; prolonged vomiting; 42, 46 Bartter's syndrome; 64 potassium-losing nephropathy; and in patients, including children, on long-term corticosteroid therapy. 27, 74

Deficiency of potassium may lead to muscle weakness, irregular heartbeat, mood or mental changes, or nausea or vomiting. 42, 46

Acceptance not established

There are insufficient data to show that potassium supplementation lowers blood pressure in hypertensive patients. 76

Unaccepted

Enteric-coated tablets of potassium chloride are no longer recommended for use because of the high incidence of severe injury to adjacent gastrointestinal tissues during tablet dissolution. 4, 42

Pharmacology

Mechanism of action/Effect:

Potassium is the predominant cation (approximately 150 to 160  15 mEq per liter) within cells. Intracellular sodium content is relatively low. In extracellular fluid, sodium predominates and the potassium content is low (3.5  15 to 5 mEq per liter). A membrane-bound enzyme, sodium-potassium-activated adenosinetriphosphatase (Na +K +ATPase), actively transports or pumps sodium out and potassium into cells to maintain these concentration gradients. 73 The intracellular to extracellular potassium  21 gradients are necessary for the conduction of nerve impulses in such specialized tissues as the heart, brain, and skeletal muscle, and for the maintenance of normal renal function and acid-base balance. 74 High intracellular potassium concentrations are necessary for numerous cellular metabolic processes.

**Precautions to Consider**

Carcinogenicity

No data are available on long-term potential for carcinogenicity in animals or humans. Potassium is a normal dietary constituent. 14,  15

Pregnancy/Reproduction

Pregnancy¾Studies have not been done in humans. 34

Studies have not been done in animals.
FDA Pregnancy Category C. 25,  34

Breast-feeding

Problems in humans have not been documented.

Pediatrics

Appropriate studies on the relationship of age to the effects of potassium supplements have not been performed in the pediatric population. However, no pediatrics-specific problems have been documented to date.

Geriatrics

Although appropriate studies on the relationship of age to the effects of potassium supplements have not been performed in the geriatric population, no geriatrics-specific problems have been sufficiently documented to date. However, elderly patients are at greater risk of developing hyperkalemia due to 16 age-related changes in the ability of the kidneys to excrete potassium. 21,  22

**Drug interactions and/or related problems**

The following drug interactions and/or related problems have been selected on the basis of their potential clinical significance (possible mechanism in parentheses where appropriate)¾not necessarily inclusive (>> = major clinical significance):

Note: Combinations containing any of the following, depending on the amount present, may also interact with this medication.
Amphotericin B 71 or

Corticosteroids, glucocorticoid, especially with significant mineralocorticoid activity or 21, 27, 74

Corticosteroids, mineralocorticoid or

Corticotropin (ACTH) or

Gentamicin 69, 70 or

Penicillins (including azlocillin, carbenicillin, mezlocillin, piperacillin, ticarcillin) or 64, 72

Polymyxin B

(potassium requirements may be increased in patients receiving these medications, due to renal potassium wasting; close monitoring of serum potassium is recommended 43 )

>> Angiotensin-converting enzyme (ACE) inhibitors or 1, 2, 17, 21, 47

>> Anti-inflammatory drugs, nonsteroidal (NSAIDs) or 16, 21, 44

>> Beta-adrenergic blocking agents or 44, 59, 60

Blood from blood bank (may contain up to 30 mEq of potassium per liter of plasma or up to 65 mEq per liter of whole blood when stored for more than 10 days) or

Cyclosporine or 16, 44

>> Diuretics, potassium-sparing or 1, 47

>> Heparin or 4, 5, 6, 16, 41, 44

>> Low-salt milk or 21, 23

Potassium-containing medications, other or

Salt substitutes 3, 42

(concurrent use with potassium supplements may increase serum potassium concentrations, which may cause severe hyperkalemia and lead to cardiac arrest, especially in renal insufficiency; low-salt milk may contain up to 60 mEq of potassium per liter and most salt substitutes contain substantial amounts of

potassium; in addition, use of NSAIDs in combination with potassium supplements may increase the risk of gastrointestinal side effects 16 )

>> Anticholinergics or other medications with anticholinergic activity (See Appendix II )

(concurrent use with potassium chloride oral supplements, especially solid dosage forms, may increase severity of gastrointestinal lesions produced by potassium chloride alone; if symptoms develop, 21 patients should be carefully monitored endoscopically for evidence of lesions 10, 47 )

Calcium salts, parenteral

(potassium supplements should be used cautiously in patients receiving parenteral calcium salts because of the danger of precipitating cardiac arrhythmias)

>> Digitalis glycosides, in the presence of heart block 21

(potassium supplements are not recommended for concurrent use in digitalized patients with severe or complete heart block; however, if potassium supplements must be used to prevent or correct hypokalemia in digitalized patients, careful monitoring of serum potassium concentrations is extremely important 13, 44 )

>> Diuretics, thiazide

(increased risk of hyperkalemia when a potassium-wasting diuretic is discontinued after concurrent use with a potassium supplement 16, 42 )

Exchange resins, sodium cycle, such as sodium polystyrene sulfonate

(whether these medications are administered orally or rectally, serum potassium concentrations are reduced by sodium replacement of the potassium; fluid retention may occur in some patients because of the increased sodium intake 48 )

Insulin or 64

Sodium bicarbonate 63

(concurrent use of these medications decreases serum potassium concentration by promoting a shift of potassium ion into the cells)

Laxatives

(chronic use or overuse of laxatives may reduce serum potassium concentrations by promoting excessive potassium loss from the intestinal tract 9, 46 )

**Medical considerations/Contraindications**

The medical considerations/contraindications included have been selected on the basis of their potential clinical significance (reasons given in parentheses where appropriate)¾ not necessarily inclusive (>> = major clinical significance).
Except under special circumstances, this medication should not be used when hyperkalemia exists, because further increases in serum potassium may cause cardiac arrest.
Risk-benefit should be considered when the following medical problems exist

For potassium acetate only

Alkalosis, metabolic or respiratory

(acetate is a precursor to bicarbonate, which may exacerbate the condition 20, 24, 25 )

For all potassium supplements

>> Diarrhea, prolonged or severe, resulting in severe dehydration 21

(the loss of fluid in combination with use of potassium supplements may cause renal toxicity, which may increase the risk of hyperkalemia; if potassium supplements are given in the presence of diarrhea, 78 serum potassium should be monitored)

>> Esophageal compression or

>> Gastric emptying, delayed or

>> Intestinal obstruction or stricture or

>> Peptic ulcer

(delayed passage of potassium supplements through the gastrointestinal tract may cause or worsen gastrointestinal irritation, especially with solid dosage forms 39, 51, 55, 56, 57, 58 )

>> Familial periodic paralysis 18, 40, 52 or

Myotonia congenita 40

(potassium supplements may aggravate these conditions, although some patients with familial periodic paralysis may require potassium supplementation 49 )

>> Heart block, severe or complete 34

(increased risk of hyperkalemia, especially in digitalized patients; careful monitoring of serum potassium concentrations is recommended)

>> Hyperkalemia, or conditions predisposing to hyperkalemia, such as:
Acidosis, metabolic, acute 64

Adrenal insufficiency 52

Dehydration, acute 21, 40

Diabetes mellitus, uncontrolled 44, 52

Physical exercise, strenuous, in unconditioned persons 53

Renal failure, chronic 52

Tissue breakdown, extensive 52

(increased serum potassium concentrations possibly leading to cardiac arrest may occur; exercise-induced hyperkalemia is transient and is a problem only in patients with renal insufficiency from dehydration or those taking medications that increase serum potassium 53, 54, 61 )

Sensitivity to potassium

Patient monitoring

The following may be especially important in patient monitoring (other tests may be warranted in some patients, depending on condition; >> = major clinical significance):
Electrocardiograms (ECG) and 34

Potassium concentrations, serum and

Renal function determinations, especially serum creatinine and 1 urine output

(monitoring recommended at periodic intervals during oral therapy; recommended concurrently during parenteral therapy)

Magnesium concentrations, serum

(determinations recommended in patients with refractory hypokalemia; coexisting magnesium depletion may need correction to replenish serum potassium and/or cell potassium concentrations 12 )

pH determinations, serum

(used to help determine existence of acidosis or alkalosis and thus allow improved interpretation of serum potassium measurements; utilized more often during parenteral therapy 34 )

**Side/Adverse Effects**

The following side/adverse effects have been selected on the basis of their potential clinical significance (possible signs and symptoms in parentheses where appropriate)¾not necessarily inclusive:
Those indicating need for medical attention

Incidence less frequent

Hyperkalemia 34 (confusion; irregular or slow 16 heartbeat; numbness or tingling in hands, feet, or lips; shortness of breath or difficult breathing; unexplained anxiety; unusual tiredness or weakness; weakness or heaviness of legs)

Note: Hyperkalemia side effects are considered rare when oral dosage forms of potassium are administered to patients having normal renal function. When hyperkalemia is present, severe muscle weakness and a slow, irregular heartbeat are the most common symptoms 16, 21.

When the medication is administered parenterally, the incidence of irregular heartbeat (arrhythmias) may become more frequent.
Irregular heartbeat is usually the earliest clinical indication of hyperkalemia and is readily detected by ECG.

Incidence rare

Irritation, contact, of the alimentary tract 55, 56, 57, 58 (continuing abdominal or stomach pain, cramping, or soreness; chest or throat pain, especially when swallowing; stools containing fresh or digested blood)

Note: Irritation of the alimentary tract may occur when potassium is in contact with ulcerous areas, or when there is a high concentration of potassium in one area; the latter has resulted from improper release from oral dosage form, or from delayed passage of the dosage form through the alimentary tract. 39

Those indicating need for medical attention only if they continue or are bothersome

Incidence more frequent

For oral dosage forms 34

Diarrhea; nausea; stomach pain, discomfort, or gas, mild; vomiting

Note: These side effects occur more frequently when the medication is not taken with food or is not diluted properly.

Patient Consultation

As an aid to patient consultation, refer to Advice for the Patient, Potassium Supplements (Systemic).
In providing consultation, consider emphasizing the following selected information (>> = major clinical significance):
Description of use

Description should include function in the body; signs of deficiency

Importance of diet

Importance of proper nutrition

Potassium content of selected foods

Recommended daily intake for potassium

Not exceeding recommended amounts of potassium

Before using this medication

>> Conditions affecting use, especially:

Sensitivity to potassium
Use in the elderly¾Risk of developing hyperkalemia due to age-related changes in ability of kidneys to excrete potassium
Other medications, especially beta adrenergic blocking agents, nonsteroidal anti-inflammatory drugs, anticholinergics, potassium-sparing and thiazide diuretics, low-salt milk, other potassium-containing medications, ACE inhibitors, digitalis glycosides, or heparin
Other medical problems, especially delayed gastric emptying, esophageal compression, or intestinal obstruction or stricture, peptic ulcer; heart block; hyperkalemia or conditions predisposing to hyperkalemia for all potassium supplements; metabolic or respiratory acidosis for potassium acetate
Proper use of this medication

Proper administration technique

Necessary dilution of liquid dosage forms

Taking tablets and capsules with adequate liquids

Complete dissolution of effervescent dosage forms prior to taking

Not using tomato juice for dilution if on a sodium-restricted diet

Not crushing or chewing extended-release dosage forms, unless otherwise directed

Sprinkling contents of some extended-release capsules and some tablets over soft food such as applesauce or mixing with fruit juice, if unable to swallow whole, but only when directed to do so

>> Taking each dose immediately after a meal or with food

>> Compliance with therapy, especially when taking diuretics and digitalis

>> Proper dosing
Missed dose: Taking as soon as possible if remembered within 2 hours; going back to regular dosage schedule; not doubling doses
>> Proper storage
Precautions while using this medication

Regular visits to physician to check progress of therapy; serum potassium monitoring may be necessary

>> Not taking salt substitutes or low-salt milk or food unless approved by physician; importance of carefully reading labels of all low-salt foods to prevent excess intake of potassium 21, 23

Checking with physician before beginning strenuous physical exercise if out of condition, to prevent possible hyperkalemia

>> Checking with physician at once if signs of gastrointestinal bleeding are observed

**Side/adverse effects**

Expended wax matrix from some potassium chloride extended-release tablets may be seen in stool and be alarming to patient, although not necessarily an indication of improper dissolution of tablet or lack of bioavailability of potassium chloride

Signs of potential side effects, especially hyperkalemia or contact irritation of the alimentary tract

General Dosing Information

Caution must be observed in the attempt to correct hypokalemia in order to avoid overcompensation and a resultant hyperkalemia with accompanying cardiac arrhythmias. 40

The normal adult concentration of serum potassium is 3.5 to 5.0 millimoles or mEq per liter 65 with 4.5 millimoles or mEq often being used for a reference point. Potassium concentrations exceeding 5.5 mEq per liter are dangerous because of possible initiation of cardiac arrhythmias. 77 Normal potassium concentrations tend to be higher in neonates (7.7 mEq per liter) than in adults.
Serum potassium concentrations do not necessarily indicate the true body potassium content. A rise in plasma pH (alkalosis) and chronic acidosis may decrease plasma potassium concentration by promoting potassium excretion and increase the intracellular potassium concentration. 43 Conversely, a decrease in blood pH (acute acidosis) can cause an increase in serum potassium 6 by inhibiting potassium excretion 64.

However, it is necessary to attempt to restore serum potassium to normal in familial periodic paralysis, even though there is no total body potassium depletion 19, 21.

Adequate renal function is essential for therapy with potassium supplements, since the kidneys maintain normal potassium balance. A gradual increase in the amount of potassium ingested leads to an increased ability of the kidneys to excrete potassium, thus preventing lethal hyperkalemia. 6 The risk-benefit of potassium supplements should be considered in any patient with a higher-than-normal serum creatinine concentration. 21

Abrupt discontinuation of supplemental potassium to a patient suffering concurrent potassium losses, and also receiving digitalis preparations, may result in digitalis toxicity.
One gram of potassium acetate provides 10.26 mEq of potassium. 50

One gram of potassium bicarbonate provides 10 mEq of potassium. 13

One gram of potassium chloride provides 13.41 mEq of potassium.
One gram of potassium citrate provides 9.26 mEq of potassium. 13

One gram of potassium gluconate provides 4.27 mEq of potassium.
For oral dosage forms only

Because of their ulcerogenic tendency and the incidence of local tissue destruction produced from their dissolution, use of compressed tablets or enteric-coated tablets is not recommended. 42
Solid tablet dosage forms should not be used in patients with delayed gastric emptying, esophageal compression, or intestinal obstruction or stricture. The use of potassium tablets in such conditions increases the possibility of tissue destruction by high, local concentrations of potassium released by the tablet. 39, 51, 55, 56, 57, 58

For parenteral dosage forms only

Infusion of insulin- or glucose-containing or sodium bicarbonate solutions may decrease serum potassium concentrations because of a shift of potassium into the cells. 63

Before commencing intravenous administration of potassium chloride for large-dose replacement therapy:
· Serum potassium concentrations should be determined.
· Renal function should be determined. Adequate urine output should be ensured 19.

· Concentrated potassium chloride injection must be diluted and thoroughly mixed with a larger volume (1000 mL) of fluid suitable for intravenous administration, preferably to a concentration of 40 mEq of potassium per liter, 34 not to exceed 80 mEq per liter.
· When mixing in soft or bag-type containers of large-volume parenteral fluids, extra care must be used to ensure complete mixing and absence of pools of concentrated material. 34

· In dehydrated patients, a liter of potassium-free hydrating solution such as 0.2 or 0.45% 21 sodium chloride injection is sometimes rapidly infused to ensure hydration and adequate renal function in select patients whose condition will tolerate bolus fluids. In such patients, serum potassium should be measured, and potassium added to the solution if serum potassium levels fall. 78

During intravenous potassium chloride administration:
· To avoid hyperkalemia, the infusion rate must not be rapid; a rate of 10 mEq of potassium per hour is usually considered to be safe as long as urine output is adequate. 34 As a general rule, the rate should never exceed 1 mEq per minute for adults, or 0.02 mEq per kg of body weight per minute for children.
· Close patient monitoring by clinical observation, frequent electrocardiograms (especially during administration at the higher rates), and serum potassium determinations may be desirable as indicated by the situation. 34

· If renal dysfunction, especially acute renal failure as evidenced by oliguria and/or rising serum creatinine, should occur during infusion of potassium chloride, the infusion should be stopped at once. Subsequent infusion, if needed, should be administered very cautiously and with close monitoring 21.

Diet/Nutrition

Oral potassium supplements should be taken with 23 or immediately after a meal to minimize possible stomach upset or laxative action. Most oral tablets or capsules should be swallowed whole, never

crushed or chewed. However, some commercial extended-release products, because of microencapsulation, may be crushed, chewed, or sprinkled on a spoonful of soft food if the patient is unable to swallow the solid dosage form whole. The oral solution, soluble tablet, and powder forms should be completely dissolved in at least one-half glass (120 mL) of cold water or juice, then sipped slowly over a 5- to 10-minute period. 23

Recommended dietary intakes for potassium are defined differently worldwide.
For U.S.¾

The Recommended Dietary Allowances (RDAs) for vitamins and minerals are determined by the Food and Nutrition Board of the National Research Council and are intended to provide adequate nutrition in most healthy persons under usual environmental stresses. In addition, a different designation may be used by the FDA for food and dietary supplement labeling purposes, as with Daily Value (DV). DVs replace the previous labeling terminology United States Recommended Daily Allowances (USRDAs). 46, 98

For Canada¾

Recommended Nutrient Intakes (RNIs) for vitamins, minerals, and protein are determined by Health and Welfare Canada and provide recommended amounts of a specific nutrient while minimizing the risk of chronic diseases. 99

There is no RDA or RNI established for potassium; 1600 to 2000 mg (40 to 50 mEq) per day is considered adequate for adults. 46

Low-salt milk and salt substitutes may contain substantial amounts of potassium. These and other low-salt foods, especially breads and canned foods, should be avoided during treatment with potassium supplements, unless otherwise specified by the health care professional. Serum potassium may increase with resulting hyperkalemia, especially in patients with renal insufficiency. 42

The following table indicates the potassium content of selected foods:

| Food (amount) | Milligrams of potassium | Milliequivalents of potassium |
|---|---|---|
| Acorn squash, cooked (1 cup) | 896 | 23 |
| Potato with skin, baked (1 long) | 844 | 22 |
| Spinach, cooked (1 cup) | 838 | 21 |
| Lentils, cooked (1 cup) | 731 | 19 |
| Kidney beans, cooked (1 cup) | 713 | 18 |
| Split peas, cooked (1 cup) | 710 | 18 |
| White navy beans, cooked (1 cup) | 669 | 17 |
| Butternut squash, cooked (1 cup) | 583 | 15 |
| Watermelon (1/16) | 560 | 14 |
| Raisins (1/2 cup) | 553 | 14 |
| Yogurt, low-fat, plain (1 cup) | 531 | 14 |
| Orange juice, frozen (1 cup) | 503 | 13 |
| Brussel sprouts, cooked (1 cup) | 494 | 13 |

| | | |
|---|---|---|
| Zucchini, cooked, sliced (1 cup) | 456 | 12 |
| Banana (medium) | 451 | 12 |
| Collards, frozen, cooked (1 cup) | 427 | 11 |
| Cantaloupe (1/4) | 412 | 11 |
| Milk, low-fat 1% (1 cup) | 348 | 9 |
| Broccoli, frozen, cooked (1 cup) | 332 | 9 |

For treatment of adverse effects

Treatment of hyperkalemia includes:

· If appropriate, discontinuing blood products, foods and medication that contain potassium, as well as ACE inhibitors, beta blocking agents, nonsteroidal anti-inflammatory drugs (NSAIDs), heparin, cyclosporine, and potassium-sparing diuretics. 34, 66

· Administering 10% dextrose containing 10 to 20 units of insulin per liter at a rate of 300 to 500 mL of solution per hour. 34, 50, 67 This will facilitate a shift of potassium into the cells. 63

· Correcting any existing acidosis with 50 mEq intravenous sodium bicarbonate over 5 minutes. The dose may be repeated in 10 to 15 minutes if needed. 63 This will facilitate a shift of potassium into the cells. 63

· Administering a calcium salt (calcium gluconate, 0.5 to 1 gram, over a 2-minute period) to antagonize the cardiotoxic effects in patients whose electrocardiograms (ECGs) show absent P waves, or a broad QRS complex, and who are not receiving digitalis glycosides. Doses may be repeated after 2-minute intervals. 50, 63

· Utilizing exchange resins to remove excess potassium from the body by adsorption and/or exchange of potassium. 50 The oral dose of sodium polystyrene sulfonate is 20 to 50 grams of the resin dissolved in 100 to 200 mL of 20% sorbitol. The dose may by given every 4 hours up to four or five daily doses until potassium levels return to normal. 63 It may also be given as a retention enema by mixing 8 grams of sodium polystyrene sulfonate and 50 grams of sorbitol in 200 mL of water. 63 The retention enema exchanges potassium faster than the oral sodium polystyrene sulfonate. 67

· Utilizing hemodialysis or peritoneal dialysis to reduce serum potassium concentrations. 34 May be necessary in patients with renal function impairment. 50

· Ascertaining adequate urine output and, if not contraindicated by the clinical condition of the patient, maintaining a high urine output with normal saline solutions and loop diuretics. 21, 67

Caution must be observed when treating hyperkalemia in digitalized patients, since rapid reduction of serum potassium concentrations may induce digitalis toxicity.

POTASSIUM ACETATE

Parenteral Dosage Forms

Note: Injectable potassium products must be diluted prior to intravenous administration. Direct patient injection of potassium concentrate may be instantaneously fatal. 34

POTASSIUM ACETATE INJECTION USP

Usual adult and adolescent dose

Electrolyte replenisher or
Hypokalemia (treatment)¾
Intravenous infusion, the dose and rate of infusion to be determined by the individual requirements of each patient, up to 400 mEq of potassium a day (usually not more than 3 mEq per kg of body weight). The response of the patient, as determined by the measurement of serum potassium concentration and the electrocardiogram following the initial 40 to 60 mEq infused, should indicate the subsequent infusion rate required. 25

Serum potassium greater than 2.5 mEq per liter: Intravenous infusion, up to 200 mEq of potassium a day in a concentration less than 30 mEq per liter and at a rate not exceeding 10 mEq per hour. 25

Serum potassium less than 2.0 mEq per liter with ECG changes or paralysis (urgent treatment): Intravenous infusion, up to 400 mEq of potassium a day in a suitable concentration and at a rate up to, 25 but usually not exceeding, 20 50 mEq per hour.

Note: Some urgent situations may require a dosage and/or rate of administration that temporarily exceeds those stated above.
Hypokalemia (prophylaxis)¾
Intravenous infusion, as part of total parenteral nutrition solutions, the specific amount determined by individual patient need.

Usual pediatric dose

Electrolyte replenisher or
Hypokalemia (treatment)¾
Intravenous infusion, up to 3 mEq of potassium per kg of body weight or 40 mEq per square meter of body surface a day. Volume of administered fluids must be adjusted to body size. 25

Hypokalemia (prophylaxis)¾
Intravenous infusion, as part of total parenteral nutrition solutions, the specific amount determined by individual patient need.

Strength(s) usually available

U.S.¾2 mEq of potassium per mL (Rx) [Generic]

4 mEq of potassium per mL (Rx) [Generic]

Canada¾Not commercially available.

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Protect from freezing.

POTASSIUM BICARBONATE

Oral Dosage Forms

POTASSIUM BICARBONATE EFFERVESCENT TABLETS FOR ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 25 to 50 mEq of potassium dissolved in one-half to one glass (120 to 240 mL) of cold water one or two times a day, the dosage being adjusted as needed and tolerated. 26

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Dosage has not been established. 26

Strength(s) usually available

U.S.¾6.5 mEq of potassium (650 mg) (Rx) [Generic] 80

20 mEq of potassium (Rx)[K+ Care ET 81]

25 mEq of potassium (Rx)[K+ Care ET] [K-Electrolyte 82] [K-Ide] [Klor-Con/EF] [K-Lyte] [K-Vescent 83] [Generic] 80

Canada¾25 mEq of potassium (Rx)[K-Lyte]

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container or original foil packaging.

Auxiliary labeling:

· Take dissolved in cold water.
· Take with or immediately after food.

Note: Dispense in original foil packaging to help maintain moisture-free condition until use.

POTASSIUM BICARBONATE AND POTASSIUM CHLORIDE

Oral Dosage Forms

POTASSIUM BICARBONATE AND POTASSIUM CHLORIDE FOR EFFERVESCENT ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 mEq of potassium dissolved in one-half to one glass (120 to 240 mL) of cold water one or two times a day, the dosage being adjusted as needed and tolerated. 27

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Dosage has not been established.

Strength(s) usually available

U.S.¾20 mEq of potassium per 2.8-gram packet (Rx)[Klorvess Effervescent Granules]

Canada¾20 mEq of potassium per 2.8-gram packet (Rx)[Neo-K]

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container or original foil packaging.

Auxiliary labeling:

· Take dissolved in cold water. 27

· Take with or immediately after food. 27

Note: Dispense in original foil packaging to help maintain moisture-free condition until use.

POTASSIUM BICARBONATE AND POTASSIUM CHLORIDE EFFERVESCENT TABLETS FOR ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20, 25, or 50 mEq of potassium dissolved in one-half to one glass (120 to 240 mL) of cold water one or two times a day, the dosage being adjusted as needed and tolerated. 28

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Dosage has not been established.

Strength(s) usually available

U.S.¾20 mEq of potassium (Rx)[Klorvess]

25 mEq of potassium (Rx)[K-Lyte/Cl]

50 mEq of potassium (Rx)[K-Lyte/Cl 50]

Canada¾12 mEq of potassium (Rx)[Potassium-Sandoz]

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container or original foil packaging.

Auxiliary labeling:

· Take dissolved in cold water.
· Take with or immediately after food.

Note: Dispense in original foil packaging to help maintain moisture-free condition until use.

POTASSIUM BICARBONATE AND POTASSIUM CITRATE

Oral Dosage Forms

POTASSIUM BICARBONATE AND POTASSIUM CITRATE EFFERVESCENT TABLETS FOR ORAL SOLUTION

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 25 or 13 50 mEq of potassium dissolved in one-half to one glass (120 to 240 mL) of cold water one or two times a day, the dosage being adjusted as needed and tolerated. 28

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Dosage has not been established.

Strength(s) usually available

U.S.¾25 mEq of potassium (Rx)[Effer-K]

50 mEq of potassium (Rx)[K-Lyte DS]

Canada¾Not commercially available.

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in original foil packaging.

Auxiliary labeling:

· Take dissolved in cold water.
· Take with or immediately after food.

Note: Dispense in original foil packaging to help maintain moisture-free condition until use.

POTASSIUM CHLORIDE

Oral Dosage Forms

POTASSIUM CHLORIDE EXTENDED-RELEASE CAPSULES USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis)¾
Oral, the equivalent of 16 to 24 mEq of potassium a day, divided into two or three doses, the dosage being adjusted as needed and tolerated. 29

Hypokalemia (treatment)¾
Oral, 40 to 100 mEq of potassium a day, divided into two or three doses, the dosage being adjusted as needed and tolerated. 29

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Dosage has not been established.

Strength(s) usually available

U.S.¾8 mEq (600 mg) of potassium (Rx)[Micro-K] [Generic] 85

10 mEq (750 mg) of potassium (Rx)[K-Lease] [K-Norm] [Micro-K 10] [Generic]

Canada¾8 mEq (600 mg) of potassium (Rx)[Micro-K]

10 mEq (750 mg) of potassium (Rx)[Micro-K 10]

Packaging and storage:

Store below 30 °C (86 °F). Store in a tight container.

Auxiliary labeling:

· Swallow capsules whole with a full glass of water.
· Do not chew or crush.
· Take with or immediately after food.

Note: Extended release over an 8- to 10-hour period. Polymeric particle coating of one product allows contents of the capsule to be sprinkled over soft food or mixed with juice.

POTASSIUM CHLORIDE ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 mEq of potassium diluted in one-half glass (120 mL) of cold water or juice one to four times a day, the dosage being adjusted as needed and tolerated. 30

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 15 to 40 mEq of potassium per square meter of body surface or 1 to 3 mEq of potassium per kg of body weight a day administered in divided doses and well diluted in water or juice.

Strength(s) usually available

U.S.¾10 mEq (750 mg) of potassium per 15 mL (Rx) [Generic] (alcohol 5%)

20 mEq (1.5 grams) of potassium per 15 mL (Rx)[Cena-K] [Kaochlor 10% (alcohol 5%) (tartrazine)] [Kaochlor S-F 10% (alcohol 5%)] [Kay Ciel (alcohol 4%)] [Klorvess 10% Liquid (alcohol 0.75%)] [Potasalan (alcohol 4%)] [Generic]

30 mEq (2.25 grams) of potassium per 15 mL (Rx)[Rum-K]

40 mEq (3 grams) of potassium per 15 mL (Rx)[Cena-K] [Kaon-Cl 20% Liquid (alcohol 5%)] [Generic]

Canada¾10 mEq (750 mg) of potassium per 15 mL (Rx)[KCL 5%]

20 mEq (1.5 grams) of potassium per 15 mL (Rx)[K-10] [Kaochlor-10] [Roychlor-10%]

40 mEq (3 grams) of potassium per 15 mL (Rx)[Kaochlor-20]

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container. Protect from freezing.

Stability:

Some commercial preparations contain coloring agents that fade when exposed to light. Active ingredients are not affected by light.

Auxiliary labeling:

· Take mixed in cold water or juice. 30

· Take with or immediately after food. 30

POTASSIUM CHLORIDE FOR ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 15 to 25 mEq of potassium diluted in four to six ounces (180 mL) of cold water two to four times a day, the dosage being adjusted as needed and tolerated. 31

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 15 to 25 mEq of potassium per square meter of body surface, or 1 to 3 mEq of potassium per kg of body weight a day administered in divided doses and well diluted in water or juice.

Strength(s) usually available

U.S.¾10 mEq (745 mg) of potassium per packet (Rx) [Generic] 85

15 mEq (1.12 grams) of potassium per packet (Rx)[K+ Care 81] [K-Lor]

20 mEq (1.5 grams) of potassium per packet (Rx)[Gen-K] [Kato] [Kay Ciel] [K+ Care] [K-Ide] [K-Lor] [Klor-Con Powder] [K-Sol 83, 86] [Generic]

25 mEq (1.8 grams) of potassium per packet or dose (Rx)[Gen-K 93] [K+ Care 81] [Klor-Con/25 Powder] [K-Lyte/Cl Powder (bulk or packet)] [Generic] 85

Canada¾20 mEq (1.5 grams) of potassium per packet (Rx)[K-Lor]

25 mEq (1.8 grams) of potassium per packet (Rx)[K-Lyte/Cl]

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container.

Auxiliary labeling:

· Take dissolved in cold water or juice.
· Take with or immediately after food.

POTASSIUM CHLORIDE FOR ORAL SUSPENSION

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 mEq of potassium mixed in two to six ounces (180 mL) of cold water one to five times a day, the dosage being adjusted as needed and tolerated. 32

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Dosage has not been established.

Strength(s) usually available

U.S.¾20 mEq (1.5 grams) of potassium per packet (Rx)[Micro-K LS]

Canada¾Not commercially available.

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), in a tight container, unless otherwise specified by manufacturer.

Preparation of dosage form:

Add granules to 2 to 6 ounces of water or juice, and stir for 1 minute before swallowing. The granules may also be added to 2 ounces of orange juice, tomato juice, apple juice, or milk. 32

Auxiliary labeling:

· Take dissolved in cold water or juice.
· Take with or immediately after food.

Note: May be sprinkled on food. 32

POTASSIUM CHLORIDE EXTENDED-RELEASE TABLETS USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 6.7 to 20 mEq of potassium (approximately 500 to 1.5 grams of potassium chloride, respectively) three times a day. 33

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Dosage has not been established. 33

Strength(s) usually available

U.S.¾6.7 mEq (500 mg) of potassium (Rx)[Kaon-Cl (tartrazine)]

8 mEq (600 mg) of potassium (Rx)[K-8 87] [Klor-Con 8] [Slow-K] [Generic]

10 mEq (750 mg) of potassium (Rx)[K+ 10] [Kaon-Cl-10 (tartrazine)] [K-Dur] [Klor-Con 10] [Klotrix] [K-Tab] [Ten-K (scored)] [Generic] 92

20 mEq (1.5 grams) of potassium (Rx)[K-Dur (scored)]

Canada¾6.7 mEq (500 mg) of potassium (Rx)[K-Long]

8 mEq (600 mg) of potassium (Rx)[Apo-K 89] [Slow-K]

10 mEq (750 mg) of potassium (Rx)[Kalium Durules]

12 mEq (900 mg) of potassium (Rx)[K-Med 900 90]

20 mEq (1500 mg) of potassium (Rx)[K-Dur (scored)] 91

Packaging and storage:

Store below 30 °C (86 °F). Store in a tight container.

Auxiliary labeling:

· Swallow tablets whole with a full glass of water. 33

· Do not chew or crush unless otherwise directed.
· Take with or immediately after food.

Additional information:

Most extended-release tablets utilize an inert wax matrix from which the drug is slowly leached out as it passes through the gastrointestinal tract. The expended wax matrix may appear intact in the stool.
The extended-release tablets without a wax matrix may be swallowed whole or broken or crushed and sprinkled on food.

Parenteral Dosage Forms

POTASSIUM CHLORIDE FOR INJECTION CONCENTRATE USP

Note: Injectable potassium chloride products in strengths of 1.5 mEq and 2 mEq per mL must be diluted prior to intravenous administration. Direct patient injection of potassium concentrate may be instantaneously fatal. 34 However, injectable potassium chloride products in strengths of 0.1, 0.2, 0.3, and 0.4 mEq per mL are intended for use with a calibrated infusion device and do not require dilution.
Usual adult and adolescent dose

Electrolyte replenisher or
Hypokalemia (treatment)¾
Intravenous infusion, the dose and rate of infusion to be determined by the individual requirements of each patient, up to 400 mEq of potassium a day (usually not more than 3 mEq per kg of body weight). The response of the patient, as determined by the measurement of serum potassium concentration and the electrocardiogram following the initial 40 to 60 mEq infused, should indicate the subsequent infusion rate required.
Serum potassium greater than 2.5 mEq per liter: Intravenous infusion, up to 200 mEq of potassium a day in a concentration less than 30 mEq per liter and at a rate not exceeding 10 mEq per hour. 34

Serum potassium less than 2.0 mEq per liter with ECG changes or paralysis (urgent treatment): Intravenous infusion, up to 400 mEq of potassium a day in a suitable concentration and at a rate up to, but usually not exceeding, 20 50 mEq per hour. 34

Note: Some urgent situations may require a dosage and/or rate of administration that temporarily exceeds those stated above.
Hypokalemia (prophylaxis)¾
Intravenous infusion, as part of total parenteral nutrition solutions, the specific amount determined by individual patient need.

Usual pediatric dose

Electrolyte replenisher or
Hypokalemia (treatment)¾
Intravenous infusion, up to 3 mEq of potassium per kg of body weight or 40 mEq per square meter of body surface a day. Volume of administered fluids must be adjusted to body size. 35

Hypokalemia (prophylaxis)¾
Intravenous infusion, as part of total parenteral nutrition solutions, the specific amount determined by individual patient need.

Strength(s) usually available

U.S.¾0.1 mEq of potassium per mL (Rx) [Generic] 100

0.2 mEq of potassium per mL (Rx) [Generic] 100

0.3 mEq of potassium per mL (Rx) [Generic] 100

0.4 mEq of potassium per mL (Rx) [Generic] 100

1.5 mEq of potassium per mL (Rx) [Generic]

2 mEq of potassium per mL (Rx) [Generic]

3 mEq of potassium per mL (Rx) [Generic] 85

10 mEq of potassium per mL (Rx) [Generic] 88

Note: To alert the practitioner to the potential danger of administering potassium chloride not intended for use in a calibration device (e.g., 1.5 or 2 mEq per mL) undiluted, USP requires that Potassium Chloride for Injection Concentrate products in vials be identified with black caps and ferrules. Ampuls must have a black band above the constriction. In addition, the words "Must Be Diluted" must appear on the cap and overseal of the cap, and the product label must bear the boxed warning "Concentrate Must Be Diluted Before Use."
Potassium chloride products in strengths of 0.1, 0.2, 0.3, and 0.4 mEq per mL are intended for use with a calibrated infusion device and do not require dilution.
Canada¾2 mEq of potassium per mL (Rx) [Generic]

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Protect from freezing.

Incompatibilities:

Potassium chloride should not be added to mannitol, blood or blood products, or amino acid or lipid-containing solutions because it may precipitate these substances from solution or cause lysis of infused red blood cells. 43

POTASSIUM GLUCONATE

Oral Dosage Forms

POTASSIUM GLUCONATE ELIXIR USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 mEq of potassium diluted in one-half glass (120 mL) of cold water or juice two to four times a day, the dosage being adjusted as needed and tolerated. 36

Usual adult prescribing limits

Up to 100 mEq of potassium daily. 42

Usual pediatric dose

Antihypokalemic¾
Oral, 20 to 40 mEq of potassium per square meter of body surface, or 2 to 3 mEq per kg of body weight a day, administered in divided doses and well diluted in water or juice.

Strength(s) usually available

U.S.¾20 mEq of potassium (4.68 grams of potassium gluconate) per 15 mL (Rx)[Kaon (alcohol 5%)] [Kaylixir (alcohol 5%)] [K-G Elixir (alcohol 5%)] [Generic]

Canada¾20 mEq of potassium (4.68 grams of potassium gluconate) per 15 mL (Rx)[Kaon] [Potassium-Rougier]

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight, light-resistant container. Protect from freezing.

Stability:

Some commercial preparations contain coloring agents that fade when exposed to light. Active ingredients are not affected by light.

Auxiliary labeling:

· Take mixed in cold water or juice.
· Take with or immediately after food.
· Keep container tightly closed.

POTASSIUM GLUCONATE TABLETS USP

Note: Certain strengths of potassium gluconate may be available over-the-counter in some stores. Unless directed by the physician, use of these products should be discouraged 75.

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 5 to 10 mEq of potassium two to four times a day.

Usual adult prescribing limits

Up to 100 mEq of potassium a day.

Usual pediatric dose

Dosage has not been established.

Strength(s) usually available

U.S.¾2 mEq of potassium (500 mg of potassium gluconate)[Glu-K (Rx) 96] [Generic] 92

2.3 mEq of potassium (550 mg of potassium gluconate) (Rx/OTC) [Generic] 95

2.5 mEq of potassium (595 mg of potassium gluconate) (Rx/OTC) [Generic] 92, 95

Canada¾Not commercially available.

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container.

Auxiliary labeling:

· Take with or immediately after food.
· Swallow tablet whole with a full glass of water.
· Do not chew or crush.

POTASSIUM GLUCONATE AND POTASSIUM CHLORIDE

Oral Dosage Forms

POTASSIUM GLUCONATE AND POTASSIUM CHLORIDE ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 mEq of potassium diluted in 30 mL or more of cold water or juice two  37 to four times a day, the dosage being adjusted as needed and tolerated.

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 to 40 mEq of potassium per square meter of body surface or 2 to 3 mEq per kg of body weight a day, administered in divided doses and well diluted in water or juice.

Strength(s) usually available

U.S.¾20 mEq of potassium per 15 mL (Rx)[Kolyum]

Canada¾Not commercially available.

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container. Protect from freezing.

Stability:

Some commercial preparations contain coloring agents that fade when exposed to light. Active ingredients are not affected by light.

Auxiliary labeling:

· Take mixed in cold water or juice.
· Take with or immediately after food.
· Keep container tightly closed.

POTASSIUM GLUCONATE AND POTASSIUM CHLORIDE FOR ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾

Oral, 20 mEq of potassium diluted in 30 mL or more of cold water or juice two  37 to four times a day, the dosage being adjusted as needed and tolerated.

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 to 40 mEq of potassium per square meter of body surface or 2 to 3 mEq per kg of body weight a day, administered in divided doses and well diluted in water or juice.

Strength(s) usually available

U.S.¾20 mEq of potassium per 5-gram packet (Rx)[Kolyum 97]

Canada¾Not commercially available.

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container or original package.

Auxiliary labeling:

· Take mixed in cold water or juice.
· Take with or immediately after food.

Note:  Dispense in original packet to help maintain moisture-free condition until use.

POTASSIUM GLUCONATE AND POTASSIUM CITRATE

Oral Dosage Forms

POTASSIUM GLUCONATE AND POTASSIUM CITRATE ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 mEq of potassium diluted in one-half glass (120 mL) of cold water or juice two to four times a day, the dosage being adjusted as needed and tolerated. 38

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 20 to 40 mEq of potassium per square meter of body surface or 2 to 3 mEq per kg of body weight a day, administered in divided doses and well diluted in water or juice.

Strength(s) usually available

U.S.¾20 mEq of potassium per 15 mL (Rx)[Twin-K]

Canada¾Not commercially available.

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight container. Protect from freezing.

Stability:

Some commercial preparations contain coloring agents that fade when exposed to light. Active ingredients are not affected by light.

Auxiliary labeling:

· Take mixed in cold water or juice.
· Take with or immediately after food.
· Keep container tightly closed.

TRIKATES

Note: Trikates consists of potassium acetate, potassium bicarbonate, and potassium citrate. 40

Oral Dosage Forms

TRIKATES ORAL SOLUTION USP

Usual adult and adolescent dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 15 mEq of potassium three or four times a day diluted in one-half glass (120 mL) of cold water or juice, the dosage being adjusted as needed and tolerated. 40

Usual adult prescribing limits

Up to 100 mEq of potassium a day. 42

Usual pediatric dose

Hypokalemia (prophylaxis or treatment)¾
Oral, 15 to 30 mEq of potassium per square meter of body surface or 2 to 3 mEq per kg of body weight a day, administered in divided doses and well diluted in water or juice.

Strength(s) usually available

U.S.¾15 mEq of potassium per 5 mL (Rx)[Tri-K]

Canada¾Not commercially available.

Packaging and storage:

Store below 40 °C (104 °F), preferably between 15 and 30 °C (59 and 86 °F), unless otherwise specified by manufacturer. Store in a tight, light-resistant container. Protect from freezing.

Auxiliary labeling:

- Take mixed in cold water or juice.
- Take with or immediately after food.