

# ORS + ZINC SOLUTION



## 1. Generic Name ORS + ZINC SOLUTION

### 2. Qualitative and quantitative composition

Each pack (200ml) contains:  
Zinc Sulphate Monohydrate IP.....0.011 g  
Eq. to Elemental Zinc ..... 4 mg  
Sodium Citrate IP..... 0.58 g  
Potassium Chloride IP..... 0.30 g  
Sodium Chloride IP..... 0.52 g  
Dextrose Anhydrous IP..... 2.70 g

### 3. Dosage form and strength

Ready to drink Solution

### 4. Clinical particulars

#### 4.1. Therapeutic indication

For oral rehydration in various etiology

#### 4.2. Posology and method of administration

Daily intake may be based on a volume of 15 ml/kg body weight for infants up to the age of 2 years and 20-40ml/kg body weight for adults and children. A reasonable approximation is:

*Infants up to the age of 2 years:* One to one and a half times the usual 24 hour feed volume.

Children: 200ml of ORS after every loose motion.

Adults (including the elderly): 200 ml – 400 ml after every loose motion.

More may be required initially to ensure early and full volume repletion.

#### 4.3. Contraindications

As such there are no known contraindications; however it should be contraindicated in case of hypersensitivity to any ingredients.

The preparation is contraindicated in patients with dehydration of 10% or more and continued vomiting.

#### 4.4. Special warnings and precautions for use

ORS with Zinc should not be used for self-treatment by patients with liver or kidney disease, patients on low potassium or sodium diets or patients with diabetes. The use of tetrapak in patients with these conditions should be supervised by a physician.

Accumulation of zinc may occur in cases of renal failure.

Prolonged use of high doses of zinc supplements, by mouth or parenterally, leads to copper deficiency with associated sideroblastic anaemia and neutropenia; full blood counts and serum cholesterol should be monitored to detect early signs of copper deficiency.

#### 4.5. Drug interactions

None has been described for ORS.

Zinc inhibits the absorption of copper; it also reduces absorption of tetracyclines, quinolones antibacterials. Hence it should be used with caution if the patient is on other medication.

Absorption of Zinc may be reduced by Iron, Penicillamine and trienetine. Hence care should be taken.

#### 4.6. Use in special populations

##### Pregnant & Nursing Women

Product is effectively safe in pregnancy and lactation, however it should be used if benefits outweigh the risk of side effects and should be used upon advised on Physician.

##### Pediatrics (<18 years)

###### Neonates

Although any moderately dehydrated individual is at risk of adverse effects, particularly if ORS are used inappropriately, there should be special concern about this group.

###### Children

As for neonates, there should be special concern for young infants, but there are no special problems with other children.

##### Geriatrics (≥ 65 years of age)

There are no special problems with this group.

##### Concurrent disease

There should be special concern about patients who are hypernatremic before treatment.

##### 4.7. Effects on ability to drive and use machines

There is no evidence regarding the effect of ORS and zinc on the ability to drive or use machines, however ORS and zinc is not expected to have any effect on the ability to drive and use machines.

##### 4.8. Undesirable effects

Vomiting can occur after administration of oral rehydration solution, and may be an indication that it was administered too quickly. If vomiting occurs, administration should be halted for 10 minutes, then resumed in smaller, more frequent, amounts.

The risk of hypernatraemia or overhydration after administration of oral rehydration solutions is low in patients with normal renal function. Overdosage of oral rehydration solutions in patients with renal impairment may lead to hypernatraemia and hyperkalaemia.

The most frequent adverse effects of zinc salts (the gluconate and sulfate) given by mouth are gastrointestinal and include abdominal pain, dyspepsia, nausea, vomiting, diarrhoea, gastric irritation, and gastritis. These are particularly common if zinc salts are taken on an empty stomach, and may be reduced by giving them with meals.

There have also been cases of irritability, headache and lethargy observed.

##### Reporting of suspected adverse reactions

To report SUSPECTED ADVERSE REACTIONS, contact FDC Limited at 1800 266 9347 or drug\_safety@fdcindia.com or report online at [http://www.fdcindia.com/adverse\\_form.php](http://www.fdcindia.com/adverse_form.php).

##### 4.9. Overdose

In the event of significant overdose, serum electrolytes should be evaluated as soon as possible, appropriate steps taken to correct an abnormalities and levels monitored until return to normal levels is established. This is particularly important in the very young and in cases of severe hepatic or renal failure.

Zinc sulfate is corrosive in overdosage. Symptoms are corrosion and inflammation of the mucous membrane of the mouth and stomach; ulceration of the stomach followed by perforation may occur. Gastric lavage and emesis should be avoided. Demulcents such as milk should be given. Chelating agents such as sodium calcium edetate may be useful.

## 5. Pharmacological properties

### 5.1. Pharmacodynamic properties

#### Oral rehydration salts (ORS)

The key constituents of ORS are sodium and glucose. The central principle of oral rehydration therapy (ORT) is the utilization of sodium-glucose co-transport in the small intestine, a phenomenon which remains largely unaffected during acute infectious diarrhea. Thus the success of ORT is largely dependent on glucose-driven sodium absorption (transcellular route) leading to passive absorption of water by the paracellular route. The clinical result is usually rapid rehydration and correction of acidosis.

This ORS composition has passed extensive clinical evaluations and stability tests. The pharmacokinetics and therapeutic values of the substances are as follows:

- 1) Glucose facilitates the absorption of sodium (and hence water) on a 1:1 molar basis in the small intestine;
- 2) Sodium and potassium are needed to replace the body losses of these essential ions during diarrhoea (and vomiting);

- 3) Citrate corrects the acidosis that occurs as a result of diarrhoea and dehydration.

### Zinc

The therapeutic benefits in acute diarrhea may be attributed to effects of zinc on various components of the immune system and its direct gastrointestinal effects. Zinc deficiency is associated with lymphoid atrophy, decreased cutaneous delayed hypersensitivity responses, lower thymic hormone activity, a decreased number of antibody forming cells and impaired T killer cell activity. Zinc deficiency has also been recently shown to affect the differentiation of CD4 response towards Th1 rather than Th2 pathway. The direct intestinal effects of zinc deficiency include decreased brush border activity, enhanced secretory response to cholera toxin, and altered intestinal permeability, which is reversed by supplementation.

## 5.2. Pharmacokinetic properties

### Oral rehydration salts (ORS)

#### Sodium absorption

Sodium absorption is accomplished by three different processes; the energy required being generated by the 'sodium pump' situated on the basolateral membrane of the enterocyte.

1. 'Electrogenic' non-nutrient coupled sodium absorption appears to be present both in the small and large intestine. Sodium ions enter the cell passively through selective ion channels down the electrochemical gradient.
2. 'Neutral' NaCl absorption occurs mainly in the ileum and appears to be accomplished through the action of a pair of linked ion exchanges.
3. The final mechanism of sodium entry into the enterocyte is coupled non-electrogenic sodium absorption which operates in both the jejunum and ileum and is the most important therapeutically. Sodium absorption is coupled to the absorption of a variety of organic solutes including glucose, amino acids, bile salts, water-soluble vitamins and organic acids. Carrier proteins responsible for sodium entry are situated in the brush border membrane and one of the best characterized is the Na-glucose symporter. This carrier protein utilizes the potential energy released as sodium ions enter the epithelial cells down their electrochemical gradient to drive the 'uphill' movement of glucose in the same direction. The 'downhill' electrochemical gradient for sodium is, as stated above, maintained by the Na<sup>+</sup>-K<sup>+</sup> ATPase of the basolateral enterocyte membrane. The configuration of the symporter is such that it is only operative when the sodium- and glucose-binding sites are occupied. Sodium efflux occurs via the sodium pump while solute leaves the cell via means of facilitated diffusion across the basolateral membrane.

#### Chloride absorption

Chloride ions cross the epithelium transcellularly through the action of the coupled ion exchangers but are also absorbed by the paracellular route down the electrical gradient generated by the 'electrogenic' and 'coupled' mechanisms of sodium entry.

#### Potassium absorption

In the small intestine, potassium ions are absorbed passively via the paracellular route.

#### Water transport

Water transport occurs by the passive route and is always secondary to the active transport of electrolytes or other solutes, increasing directly in proportion to the amount of solute transported.

### Zinc

Absorption of zinc from the gastrointestinal tract is incomplete, and is reduced in the presence of some dietary constituents such as phytates. Bioavailability of dietary zinc varies widely between different sources, but is about 20 to 30%. Zinc is distributed throughout the body with the highest concentrations found in muscle, bone, skin, eye, and prostatic fluids. It is primarily excreted in the faeces, and regulation of faecal losses is important in zinc homeostasis. Small amounts are lost in urine and perspiration.

## 6. Nonclinical properties

### 6.1. Animal Toxicology or Pharmacology

#### Oral Rehydration Salts

Since the therapy of ORS is indicated in the acute phase of diarrhea for control of dehydration and replenishment of rapid water loss, no reproductive and developmental toxicity studies are conducted. The ingredients of ORS are in consistency with Oral Rehydration Formulation of World Health Organization. The ingredients are important for maintenance of fluid and electrolyte balance in normal physiological condition, hence their safety in unquestionable.

### Zinc

Zinc is a common element in the human environment and constitutes an important trace element intervening in many biological processes. Toxicity of zinc is low; zinc deficiency represents, however, a hazard for human health. Zinc is not mutagenic and has little, if any, clastogenic properties. Zinc can induce tumours but only following local application, and does not represent a carcinogenic risk to man. It is still uncertain whether zinc can cause malignant transformation but zinc is needed for cellular proliferation of existing tumours and tumour growth is retarded by zinc deficiency. Zinc is not teratogenic; it can, in fact, avert teratogenicity of other agents. Conversely, zinc deficiency may be harmful to the developing organism.

## 7. Description

It is a Ready to drink formulation of oral rehydration salts (ORS) with Zinc available in a Tetrapak of 200 ml. Oral rehydration solution (ORS) is an oral powder-containing mixture of glucose, sodiumchloride, potassium chloride, and sodium citrate. Zinc sulfate monohydrate has a molecular weight of 179.49 g/mol and a formula of ZnSO<sub>4</sub>·H<sub>2</sub>O.

## 8. Pharmaceutical particulars

### 8.1. Incompatibilities

N/A

### 8.2. Shelf-life

18 Months from the month of manufacture

### 8.3. Packaging information

200 ml tetrapack with u-shaped straw.

### 8.4. Storage and handling instructions

Store at a temperature not exceeding 30°C.

## 9. Patient Counselling Information

In the initial stages of treatment of diarrhea, all foods including cow's or artificial milk, should be stopped. However breast milk need not be withheld. In breast fed infants it is suggested that the infant is given the same volume of ORS as the bottle fed baby and then put to the breast until satisfied. Expression of residual milk from the breasts may be necessary during this period. After 24 - 48 hours, when symptoms have subsided, the normal diet should be resumed but this should be gradual to avoid exacerbation of the condition.

When vomiting is present with the diarrhea it is advisable that small amounts of ORS be taken frequently. However, it is important that the whole of the required volume of ORS be taken. Where the kidneys are functioning normally, it is difficult to over-hydrate by mouth and where there is doubt about the dosage, more rather than less should be taken. If no improvement is seen within 24-48 hours it is recommended that the patient be seen by a physician.

## 10. Details of manufacturer

Manufactured by:  
M/s. Halewood Laboratories Pvt. Ltd.  
At: E-94, MIDC, Bhigwan Road,  
Baramati - 413 133, Dist. Pune, Maharashtra.

Marketed by:

**FDC FDC Limited**

Regd. Office: B-8, MIDC Industrial Area,  
Waluj, Aurangabad - 431 136, Maharashtra.

### 11. Details of permission or licence number with date

Mfg. Lic. No.: MH/101967A

### 12. Date of preparation

May 2021

### 13. Date of revision

N/A