

Salt Replacement Therapy & Cystic Fibrosis

All people with cystic fibrosis (CF) are at risk of increased sweat losses of sodium and chloride (the two compounds that make up salt), especially with exercise, fevers and infections, or exposure to high temperatures.

Sodium is the major electrolyte found in body fluid. Sodium regulates the amount of water in the blood and tissues – it acts like a sponge to attract and hold fluids in body tissues. Sodium is important for conducting nerve impulses, muscle contraction and is especially important for growth.

The CF sweat gland produces the same sweat as a non-CF sweat gland. BUT as the sweat travels towards the skin, the salt is not absorbed back into the blood. This means the sweat on the skin contains large amounts of salt. When a person with CF sweats a lot, they lose salt and water. Because the level of salt in the blood does not rise, the body does not recognise that the person needs to drink. This leads to dehydration. To prevent dehydration, people with CF need to replace both salt and fluid. Therefore, people with CF also need extra fluid with salt supplementation. Thirst is not a good indicator of fluid requirements during dehydration as lower levels of sodium and chloride in the blood may decrease thirst drive.

Signs and symptoms of salt and fluid deficiency include:

- ↳ hyponatremia (low salt levels in the blood)
- ↳ decreased appetite
- ↳ nausea
- ↳ vomiting
- ↳ muscle cramps
- ↳ fatigue
- ↳ poor concentration
- ↳ irritability
- ↳ headaches
- ↳ salt crystals on the skin

Hyponatremic dehydration may also contribute to thicker and more difficult to expectorate sputum. Dehydration can also cause thicker secretions in the bowel and lead to blockages in the gut.

The recommended dose of salt replacement for people with CF is based on an individual's symptoms, dietary intake, climate conditions, and exercise or activity level.

Recommended doses of sodium range from:

- 500mg/day for infants
- up to 4000mg/day for children
- 6000mg/day for adolescents and adults

The easiest and best way for people with CF to get extra salt is by adding salt to foods and eating foods that are naturally high in salt. Try to eat as many of the foods listed below every day.

Vegemite	Cheese	Olives & pickles
Butter & margarine	Salted biscuits & crackers	2 minute noodles
Potato crisps & pretzels	Nuts	Ham & bacon
Hot chips	Processed meat eg devon,	Canned fish in brine
Tomato & soy sauce	salami & sausages	Frozen or tinned meals
Gravy & dressings	Pizza	Packet pastas & rices

In addition to this, salt tablets and electrolyte drinks (Glucolyte, Gastrolyte, Pedialyte) can help prevent dehydration in people with CF. These supplements help create thirst that encourages water or fluid to be drunk. Sports drinks have less sodium (between 150-240mg per 600mL) than other electrolyte drinks but are also a good way to replace salt and fluid. There is 360mg of sodium in 600mL of Glucolyte and 240mg of sodium in one salt tablet. Nutritious fluids like milk also help prevent dehydration and help with the extra calories that most people with CF need. Remember, some salt drinks have lots of sugar in them, so good dental hygiene is very important.

Some tips

- ✓ always travel with extra salt and a water bottle
- ✓ pack a small salt shaker in the lunch box or picnic basket
- ✓ use plenty of sauces, gravies and condiments
- ✓ choose the 'salted' varieties of foods
- ✓ try freezing your electrolyte drink into ice blocks
- ✓ crush salt tablets or use table salt in your electrolyte drink – freezing this will make an icy slushy
- ✓ add salt generously to savoury foods. There is 2000mg of sodium in just 1 teaspoon of table salt!

Remember, even more salt may be needed

- by infants, as requirements are increased during rapid growth
- during periods of illness, due to reduced intake with poor appetite and increased losses with a fever
- when regular dietary intake is decreased and/or replaced by oral fluid supplements or enteral tube feeds, which have a low sodium content
- before additional strenuous work or physical activity
- when holidaying or living in a hot climate (like Queensland)

Reference:

1. Borushek, A. 2005. *Calorie, fat and carbohydrate counter*.
2. Dietitians Association of Australia Cystic Fibrosis Special Interest Group. 2006. *Australasian Clinical Practice Guidelines for Nutrition in Cystic Fibrosis*.
3. Kriemler, S., Wilk, B., Schurer, W., Wilson, W.M. & Bar-Or, O. 1999. *Preventing dehydration in children with cystic fibrosis who exercise in the heat. Medicine and Science in Sports and Exercise, Vol 31, Number 6, p 774-9.*