

St Marks' formula Electrolyte solution

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St Mark's formula Electrolyte solution is a glucose-electrolyte solution, also known as an oral rehydration solution (ORS) which is used in the management of Short Bowel Syndrome.

CCGs have recently been charged in excess of £1000 for a month's supply of a 'special' preparation for prescriptions written both for St Marks Electrolyte Mix and for the preparation written generically. In addition 'special' preparations often have a maximum of 4 weeks shelf life which can cause difficulties for patients trying to ensure they have an in date supply available.

The solution contains the following ingredients dissolved in one litre of water

- Sodium bicarbonate 2.5g (measure using one heaped 2.5ml spoonful)
- Glucose powder 20g (measure using six level 5ml spoonful's)
- Sodium Chloride 3.5g (measure using one level 5ml spoonful)

St Marks Hospital Foundation publishes a short guide on the solution and recommends patients can buy the powders from any pharmacy and some supermarkets. The ingredients are cheaper to buy than to be supplied on prescription if prescription charges are paid.

Please note only Sodium Bicarbonate 300g is a drug tariff cost controlled item. Glucose powder and sodium chloride are NOT cost controlled.

A copy of the guide from St Marks on this preparation is provided overleaf with background information from UKMi on the following pages.

Information for patients- St Marks' formula electrolyte solution

Introduction

This leaflet is intended for patients who have been advised by the hospital to use St Marks' formula electrolyte solution.

This solution is used to replace fluid and electrolytes lost through diarrhoea. (Electrolytes are natural substances found in the body which need to be kept in balance to maintain good health. They include sodium, chloride and bicarbonate.)

St Marks' solution is easily absorbed in the gut and is often given to patients whose bowel cannot absorb other fluids well. Your doctor will advise you how much normal fluid you can drink in addition to your St Marks' solution. It is important to adhere to this advice.

The leaflet contains instructions for making the solution and how to obtain the ingredients needed.

Details to be filled in by hospital

Patients Name: _____

Date: _____

Daily intake: _____ litres

Directions for use

Make up a fresh solution every day with:

- Sodium bicarbonate 2.5g
(measure using one heaped 2.5ml spoonful)
- Glucose powder 20g
(measure using six level 5ml spoonfuls)
- Sodium Chloride 3.5g
(measure using one level 5ml spoonful)

Make this up to one litre with tap water and stir well until all the powder is dissolved.

The taste of the mixture may be improved by keeping it chilled or by adding a small amount of fruit squash (lemon flavouring is most effective).

The solution should be sipped throughout the day.

Obtaining supplies

Ask your GP to provide a prescription for:

Sodium bicarbonate BP (powder) 200g

Sodium Chloride BP 500g

Glucose powder 450g x 4

Alternatively, sodium bicarbonate (bicarbonate of soda) and glucose powder can be bought from any community pharmacy and sodium chloride (salt) can be bought from supermarkets. This is probably cheaper for patients who pay prescription charges.

For further guidance please contact

Gastroenterology nurse specialists:

Karen Holbrook
Sarah York
Alison Ward
via the Inflammatory Bowel Disease
Patient Helpline: 08454 222475

Departments involved in writing leaflet

Medicines Information, GRH
Gastroenterology department

Approved by: East Kent Prescribing Group (Representing Ashford CCG, Canterbury and Coastal CCG, South Kent Coast CCG and Thanet CCG)

Date: January 2015

Updated: February 2018 by Gurpreet Viridi

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What is St Mark's Electrolyte Mix (solution)?

Prepared by UK Medicines Information ([UKMi](http://www.ukmi.nhs.uk)) pharmacists for NHS healthcare professionals
Before using this Q&A, read the disclaimer at www.ukmi.nhs.uk/activities/medicinesQAs/default.asp
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Background

St Mark's Electrolyte Mix is a glucose-electrolyte solution, also known as an oral rehydration solution (ORS) which is used in the management of Short Bowel Syndrome (1). Short Bowel Syndrome occurs as a result of extensive intestinal resection or functional abnormality and reduces the small bowel's capacity to absorb fluid and nutrients (2). This can lead to dehydration, weight loss, malabsorption of fluids, and electrolyte imbalance (3). One of the main aims of management is to increase fluid uptake and improve absorption (3). Most patients will require fluid, electrolyte and nutrient supplementation, and some patients may require intravenous nutrition (IVN) or intravenous fluids (IVF) to maintain health and growth (3). ORS are important in the maintenance of adequate fluid balance as they help decrease the need for IVN or IVF (4,5).

Answer

Patients with short bowel have a disrupted fluid and nutrient absorption process leading to excessive fluid losses (6). Hypotonic fluids such as tea, coffee, water, carbonated drinks, should be avoided. Drinking hypotonic fluids will lead to sodium and fluid moving from the body into the intestine and being passed out (3). This will result in a high output and sodium depletion. Isotonic fluids are glucose-electrolyte solutions which optimise the ratio of sodium to glucose and allow greater fluid and sodium absorption across the jejunum (5,7). The glucose present in the intestinal mucosa promotes the passive absorption of both salt and water via a solvent drag mechanism (4,7). At least 90mmol/L of sodium are necessary to maximise the water and sodium absorption (5,7).

The original standard World Health Organization (WHO) oral rehydration solution contains a sodium concentration of 90mmol/L, but it also contains potassium which can cause hyperkalaemia in some patients (1). Standard "sport drinks" are not suitable as they contain a high sugar content and low sodium content (7). There are many proprietary solutions available, however these are costly and have low sodium content (8). Due to the lack of suitable preparations available, St Mark's Hospital in London has produced a unique solution called "St Mark's Electrolyte Mix". This is a glucose-electrolyte mix which contains 90mmol/L of sodium and no potassium (1,9).

The patient should make the solution up fresh every day using the following measurements (9):

- ◆ 20g (six level 5mL spoonfuls) of Glucose
- ◆ 2.5g (one heaped 2.5mL spoonful) of Sodium Bicarbonate (baking soda) / if the patient cannot tolerate sodium carbonate, use Sodium Citrate
- ◆ 3.5g (one level 5mL spoonful) of Sodium Chloride (salt)

This is then dissolved in 1 Litre of tap water, and the patient should drink up to the prescribed volume throughout the day (3,9). Two to three litres per day may be necessary to maintain hydration (5).

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The solution can be stored at room temperature or in the fridge but it must be discarded after 24 hours mixing and a fresh solution prepared the next day (9).

The powders can be purchased from community pharmacies and supermarkets, and will often be cheaper than a single prescription charge. If the solution is prescribed on an NHS prescription the constituents should be prescribed separately for the patient to make the solution up fresh every day (10). This is preferable to prescribing a 'special' product for which costs will be high (11).

Patients should be strongly encouraged to avoid plain water or hypotonic fluid consumption when they are thirsty and to substitute it with ORS (8). If ice is used, it should be made from the ORS itself (1). Non-electrolyte drinks should be restricted to one litre a day (2). Patients may benefit from separating their ingestion of fluid from the intake of food (5). Eating stimulates gastric fluid production and therefore increases fluid losses. Patients should be advised to avoid all fluids 30 - 60 minutes before and after eating to minimise dehydration (2,9).

The patient may find the solution bitter in taste due to the sodium bicarbonate. This can be minimised by storing the solution in the refrigerator and/or by the addition of a small amount of fruit juice or lemon or lime squash and sipping through a straw (1,3,9). If this continues to be a problem, the sodium bicarbonate can be replaced by the same quantity of sodium citrate (3,9).

Summary

St Mark's Electrolyte Mix is a type of oral rehydration solution used in the management of short bowel syndrome. It has to be made daily using the stated formula and if the patient finds the solution unpalatable then advise as above.

Limitations

There are other similar formulations available which may be referred to as St Mark's mix. These are variations of the basic formula and may have a different electrolyte content. Locally prepared formulas should be checked.

References

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- (11) Personal communication. Jacqueline Eastwood. Lead Pharmacist. St Mark's Hospital. The North West London Hospital NHS Trust. 03/12/2015.

Quality Assurance

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Search strategy

- ◆ EMBASE: ORAL REHYDRATION SOLUTION AND (SHORT BOWEL SYNDROME/OR MALABSORPTION/) [Limit to: Human and Publication Year 2014-2015]
- ◆ PubMed: ("short bowel syndrome"[MeSH Terms] OR "malabsorption syndromes"[MeSH Terms]) AND "rehydration solutions"[MeSH Terms] AND ("2010/11/18"[PDat] : "2015/11/16"[PDat])
- ◆ Clinical specialist: Jackie Eastwood, Specialist Pharmacist, Gastroenterology, St Marks Hospital.