

Chapter 50:

Oral Rehydration Therapy

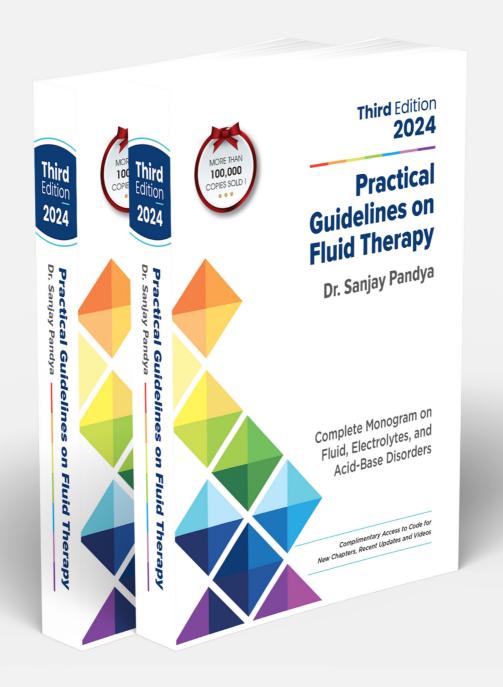




Table of Contents

Part 1 Physiology

Overview of total body fluid distribution, water balance, and electrolyte compartments.

Chapter 1

Part 2 Basics of Intravenous Fluids and Solutions

Introduction to crystalloids and colloids, their composition, clinical use, precautions, and contraindications.

Chapter 2-5

Part 3 Fluid Replacement Strategies

Principles of fluid therapy, including maintenance, resuscitation, and special considerations for the elderly.

Chapter 6-9

Part 4 Parenteral Additives

Composition, clinical applications, and precautions for various parenteral additives.

Chapter 10-14

Part 5 Hemodynamic Monitoring

Principles and techniques for assessing fluid status and cardiac output, using basic and advanced methods.

Chapter 15-19

Part 6 Electrolyte Disorders

Causes, presentation, diagnosis, and management of various electrolyte imbalances.

Chapter 20-29

Part 7 Acid-Base Disorders

Concepts, interpretation, and management of metabolic and respiratory acid-base disorders.

Chapter 30-33

Part 8 Fluid Therapy in Medical Disorders

Guidelines for fluid management in conditions like GI diseases, liver disorders, respiratory issues, and diabetic emergencies.

Chapter 34-41

<u>Part 9 Fluid Therapy in Surgical</u> Disorders

Fluid management before, during, and after surgery, including TURP syndrome and burns.

Chapter 42-47

Part 10 Fluid Therapy in Pediatrics

Special considerations for fluid management in children and neonates, including resuscitation, maintenance, and oral rehydration.

Chapter 48-50

Part 11 Fluid Therapy in Obstetrics

Fluid management strategies for pregnancy, cesarean delivery, preeclampsia, and labor-related hyponatremia.

Chapter 51-54

Part 12 Parenteral Nutrition

Principles, indications, and administration of parenteral nutrition, with disease-specific guidelines and complication management.

Chapter 55-57



50 Oral Rehydration Therapy

Oral Rehydration Solutions vs.	
Oral Rehydration Therapy	60
Indications	606
Contraindications	606
Pharmacological Basis	607
Effect of salt-containing water without glucose	607
Adding glucose to salt-containing water	607
Recommended Composition	
of ORS	608
Glucose content	608
Sodium content	608
Osmolarity	609
Potassium content	609
Citrate content to correct acidosis.	.609

Types of Oral Rehydration	
Solutions	609
WHO Standard ORS	610
WHO low osmolarity ORS	.611
ReSoMal ORS	.611
Rice-based ORS	612
Zinc in ORS	612
Treatment Plan Based on Severity	
of Dehydration	612
Plan A: Home treatment	612
Plan B: Clinic-based ORT	613
Plan C: Admission and IV fluid	
therapy	613
Method of Administration	613
Monitoring ORS Therapy	614

Oral rehydration therapy (ORT) is a remarkable innovation that changed the outcome of millions of children suffering from diarrhea globally [1, 2]. ORT is a wonderful discovery that has saved more lives than any other treatment modality over the past century [3]. ORT is a cost-effective, noninvasive alternative to intravenous fluids, offering the benefits of being less expensive and having a lower complication rate.

ORT eliminates the need for IV fluid infusion, which requires a skilled professional to establish a venous line, especially in infants, and also avoids the risks of pulmonary edema or electro-

lyte imbalance associated with IV fluid therapy. The efficacy of ORT is often underestimated due to its low cost, leading to a lack of trust and subsequent underuse [4].

ORAL REHYDRATION SOLUTIONS VS. ORAL REHYDRATION THERAPY

The terms "oral rehydration therapy" and "oral rehydration solutions" are often used interchangeably. Oral rehydration therapy refers to the broader practice of using a variety of solutions, including



oral rehydration solution (ORS), for rehydration, typically containing a mixture of salt, sugar, and water. On the other hand, ORS represents specific formulations, such as the WHO-recommended mixture of glucose and electrolytes, which are

scientifically designed to treat dehydration effectively. Thus, ORS stands out as the most scientifically advanced and effective method for treating dehydration among all ORT options.

Want to read more?

Get Printed Version

Get Kindle Version

REFERENCES

- Hirschhorn N. The treatment of acute diarrhea in children. An historical and physiological perspective. Am J Clin Nutr. 1980;33(3):637–63.
- Hartman S, Brown E, Loomis E, et al. Gastroenteritis in Children. Am Fam Physician. 2019;99(3):159–165.
- Guandalini S. Treatment of acute diarrhea in the new millennium. J Pediatr Gastroenterol Nutr 2000;30(5):486–489.
- Satheesh G, Unnikrishnan MK. The alarming need for universalising Oral Rehydration Therapy: How many more children must die? Journal of Global Health Economics and Policy. 2022;2:e2022007.
- World Health Organization. Oral rehydration salts: production of the new ORS. World Health Organization 2006.
- Ofei SY, Fuchs GJ 3rd. Principles and practice of Oral rehydration. Curr Gastroenterol Rep. 2019;21(12):67.
- Lenters LM, Das JK, Bhutta ZA. Systematic review of strategies to increase use of oral rehydration solution at the household level. BMC Public Health. 2013;13(3):S28.
- Munos MK, Walker CL, Black RE. The effect of oral rehydration solution and recommended home fluids on diarrhoea mortality. Int J Epidemiol. 2010;39 Suppl 1(Suppl 1):i75–87.
- Spandorfer PR, Alessandrini EA, Joffe MD, et al.
 Oral versus intravenous rehydration of moderately
 dehydrated children: a randomized, controlled trial.
 Pediatrics. 2005;115(2):295–301.
- Hartling L, Bellemare S, Wiebe N, et al. Oral versus intravenous rehydration for treating dehydration due

- to gastroenteritis in children. Cochrane Database Syst Rev. 2006;2006(3):CD004390.
- Centers for Disease Control and Prevention. Guidelines for the Management of Acute Diarrhea after a Disaster. 2014. Available from: https://www. cdc.gov/disasters/disease/diarrheaguidelines.html.
- Guarino A, Ashkenazi S, Gendrel D, et al. European Society for Pediatric Gastroenterology, Hepatology, and Nutrition/European Society for Pediatric Infectious Diseases evidence-based guidelines for the management of acute gastroenteritis in children in Europe: update 2014. J Pediatr Gastroenterol Nutr. 2014;59(1):132–52.
- Powers KS. Dehydration: isonatremic, hyponatremic, and hypernatremic recognition and management. Pediatr Rev 2015;36(7):274

 –85.
- Mahalanabis D, Sack RB, Jacobs B, et al. Use of an oral glucose-electrolyte solution in the treatment of paediatric cholera--a controlled study. J Trop Pediatr Environ Child Health. 1974;20(2):82–7.
- Loo DD, Zeuthen T, Chandy G, et al. Cotransport of water by the Na+/glucose cotransporter. Proc Natl Acad Sci U S A. 1996;93(23):13367–70.
- Chen L, Tuo B, Dong H. Regulation of intestinal glucose absorption by ion channels and transporters. Nutrients. 2016;8(1):43.
- Sarangi G, Mohanty N, Kadam N. The Prospects of ORS And Miles Ahead; New Indian Journal of Pediatrics, 2019;8(3):39–54.
- Goodall RM. Oral Rehydration Therapy: How it Works. Rehydration Project: Focus on Diarrhea, Dehydration and Rehydration. Updated 2019 Jul 18. Available from: https://rehydrate.org/ors/ort-how-it-



- works.htm.
- Buccigrossi V, Lo Vecchio A, Bruzzese E, et al. Potency of oral rehydration solution in inducing fluid absorption is related to glucose concentration. Sci Rep 2020;10(1):7803.
- WHO. Oral rehydration salts (ORS) a new reduced osmolarity formulation. updated: 23 August, 2019. [ONLINE] Available via http://www.rehydrate.org/ ors/expert-consultation.html (Accessed 27 September 2023).
- World Health Organization. 2002. "New Formula Oral Rehydration Solution." In WHO Drug Information. Vol. 16, No. Geneva: WHO. Available at http://apps. who.int/medicinedocs/en/d/Js4950e/2.4.html.
- Gregorio GV, Gonzales ML, Dans LF, et al. Polymerbased oral rehydration solution for treating acute watery diarrhoea. Cochrane Database Syst Rev. 2016;12(12):CD006519.
- Aghsaeifard Z, Heidari G, Alizadeh R. Understanding the use of oral rehydration therapy: A narrative review from clinical practice to main recommendations. Health Sci Rep. 2022;5(5):e827.
- CHOICE study group. Multicenter, Randomized, double-blind clinical trial to evaluate the efficacy and safety of a reduced Osmolarity Oral Rehydration salts solution in children with acute watery diarrhea. Pediatrics. 2001;107(4):613–8.
- Hahn S, Kim Y, Garner P. Reduced osmolarity oral rehydration solution for treating dehydration due to diarrhoea in children: systematic review. BMJ 2001;323(7304):81–5.
- Hahn S, Kim S, Garner P. Reduced osmolarity oral rehydration solution for treating dehydration caused by acute diarrhoea in children. Cochrane Database Syst Rev 2002;(1):CD002847.
- Islam M, Samadi AR, Ahmed SM, et al. Oral rehydration therapy: Efficacy of sodium citrate equals to sodium bicarbonate for correction of acidosis in diarrhoea. Gut 1984:25(8):900

 –4.
- Suh JS, Hahn WH, Cho BS. Recent Advances of Oral Rehydration Therapy (ORT). Electrolyte Blood Press. 2010;8(2):82–6.
- Houston KA, Gibb JG, Maitland K. Oral rehydration of malnourished children with diarrhoea and dehydration: a systematic review. Wellcome Open Res. 2017;2:66.
- Mohanty N, Thapa BR, Mathai J, et al. Low Osmolarity Oral Rehydration Salt Solution (LORS) in Management of Dehydration in Children. Indian Pediatr. 2021;58(3):266–272.
- Bawankar B. Use of Low Osmolarity Oral Rehydration Salt solution (LORS) in the treatment of dehydration in children. Asian J Biomed Pharmaceut Sci. 2022;12(92):137.
- 32. Hirschhorn N, Nalin DR, Cash RA, Greenough WB 3rd. Formulation of oral rehydration solution. Lancet. 2002;360(9329):340–341.
- Duggan C, Fontaine O, Pierce NF, et al. Scientific rationale for a change in the composition of oral rehydration solution. JAMA. 2004;291(21):2628–31.

- World Health Organisation (WHO), United Nations Children Fund (UNICEF) Joint Statement: Clinical management of acute diarrhea. WHO 2004. Available from: https://www.who.int/publications/i/item/ WHO FCH CAH 04.7 Accessed October 2, 2023.
- Alam NH, Yunus M, Abu S, et al. Symptomatic hyponatremia during treatment of dehydrating diarrheal disease with reduced osmolarity oral rehydration solution. JAMA. 2006;296(5):567–73.
- Pocket book of hospital care for children 2nd edition. Guidelines for the management of common childhood illnesses. In: Geneva: World Health Oganization; 2013.
- 37. USAID Global Health Supply Chain Program. Manual for Procurement & Supply of Quality-Assured MNCH Commodities. MODULE 3, ORAL REHYDRATION, ORS-1. [Internet]. [cited 2023 October 3]. Available from: https://www.ghsupplychain.org/sites/default/files/2019-02/MNCH%20Commodities-OralRehydration.pdf.
- Ashworth A, Khanum S, Jackson A, et al. Guidelines for the inpatient treatment of severely malnourished children. In: Geneva: World Health Organization;2003;51.
- Gore SM, Fontaine O, Pierce NF. Impact of rice based oral rehydration solution on stool output and duration of diarrhoea: meta-analysis of 13 clinical trials. British Medical Journal, 1992;304(6822):287–91.
- Fontaine O, Gore SM, Pierce NF. WITHDRAWN: Rice-based oral rehydration solution for treating diarrhoea. Cochrane Database Syst Rev. 2007;1998(4):CD001264.
- 41. Sundari TA, Soetjiningsih I, Yati Soenarto SS, et al. Efficacy of reduced osmolarity oral rehydration solution, rice-based oral rehydration solution, and standard WHO oral rehydration solution in children with acute diarrhea a randomized open trial. Paediatr Indones 2009;49(3):169–176.
- 42. Molla AM, Ahmed SM, Greenough WB 3rd. Rice-based oral rehydration solution decreases the stool volume in acute diarrhoea. Bull World Health Organ. 1985;63(4):751–6.
- Walker CL, Black RE. Zinc for the treatment of diarrhoea: effect on diarrhoea morbidity, mortality and incidence of future episodes. Int J Epidemiol. 2010;39(Suppl 1):i63–9.
- Lazzerini M, Wanzira H. Oral zinc for treating diarrhoea in children. Cochrane Database Syst Rev 2016;12(12):CD005436.
- World Health Organization. Intervention. Zinc supplementation in the management of diarrhoea. WHO; updated 2023 Aug 9. Available from: https://www.who.int/tools/elena/interventions/zincdiarrhoea.
- 46. Kailemia M, Kariuki N, Laving A, et al. Caregiver oral rehydration solution fluid monitoring charts versus standard care for the management of some dehydration among Kenyan children: a randomized controlled trial. Int Health. 2018;10(6):442–450.



Join the Mission to Fight Kidney Diseases

Explore the world's largest multilingual website created by a global team of over 100 nephrologists.

www.KidneyEducation.com

- » Read online or download the 200-page book"Save Your Kidneys" in 40 languages—completely free.
- » This comprehensive resource offers valuable information on preventing and managing common kidney problems, tailored for kidney patients and their families.
- » It's an authentic guide, prepared by nephrologists and free from any external funding.