

Letter from the Industrial Physician



Takeshi Hirano, M.D.

- Graduated from the School of Medicine, University of Occupational and Environmental Health, Japan
- 1990 - 1992: Research Fellow, University of Southern California School of Medicine
- 2003 – 2013: Professor of the University of Kitakyushu, Faculty of Environmental Engineering
- 2013 - 2023: Professor of Kamakura Women's University, Faculty of Home Economics and Nutrition Science

Heatstroke Prevention: Reviewing the Relationship Between Sweat, Water, and Salt

The heat is really starting to kick in. How are you all feeling? This time, we've put together some info on dehydration and how to prevent it, which is something to watch out for during this season. People sweat to regulate their body temperature. However, it's important to remember that when you sweat, you lose both water and salt (sodium) at the same time. While sweat is approximately 99% water, it also contains about 0.3% sodium. Prolonged heavy sweating can lead to hyponatremia. Below, we have summarized key points for preventing dehydration through proper hydration and sodium intake. Relying solely on water can also increase the risk of hyponatremia. Those who sweat heavily should also ensure adequate sodium intake.

Timing	Recommended beverages	Beverages to avoid	Physical discomfort caused by dehydration ➤ Low blood pressure → Dizziness, vertigo ➤ Muscle cramps → Charley horse ➤ Decreased concentration and judgment ※ Especially for the elderly, those with high blood pressure, and those taking blood pressure medication, even mild dehydration can cause a significant drop in blood pressure.
Before work	Room temperature water, barley tea, oral rehydration solution	Coffee, green tea (diuretic effect)	
During work	Water, sports drinks (low sugar)	Energy drinks	
After work	Oral rehydration solution, miso soup with plenty of ingredients, etc.	Sweet soft drinks	

Simple measures include: ① drinking a cup of water every hour, ② drinking before you feel thirsty, ③ eating breakfast every day (a source of salt and water), ④ carrying salt candy or oral rehydration solution when working outdoors or in warehouses. Additionally, it is important to limit sugar intake, as excessive sugar can slow down water absorption in the intestines and cause discomfort in the stomach. The Ministry of Health, Labor, and Welfare and the World Health Organization (WHO) state that “drinks with excessively high sugar concentrations are unsuitable for hydration.”

Even in cool business attire, the body inevitably loses water and salt. To prevent health issues, remember to stay hydrated and replenish salt regularly to enjoy a healthy summer!

Reference: Differences between oral rehydration solutions and sports drinks

Comparison items	Oral rehydration solutions (OS-1, etc.)	Sports drinks (Pocari Sweat, etc.)
Sodium concentration	High (40–60 mEq/L)	Low (10–20 mEq/L)
Sugar content	Low (2–3%)	Moderate (5–6%)
Purpose	Correction and treatment of dehydration	Mild hydration and exercise
Applications	Fever, diarrhea, heatstroke	Sports and daily life

Sources and reference materials

- Ministry of Health, Labour and Welfare “Manual for Heatstroke Prevention Measures in the Workplace (Revised Edition)”
- Ministry of the Environment “Heatstroke Environmental Health Manual 2022”
- Japanese Society of Emergency Medicine “Heatstroke Treatment Guidelines 2015”
- Japanese Society of Bio-meteorology “Recommendations for Heatstroke Prevention” 2022 Edition