

Dr. Correo Hofstad
University of Washington
Department of Medicine
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BIOCHEM 1070

Lecture: The Physiological Necessity of Hydration in Healthcare

Good afternoon. Today, we are discussing the critical role of hydration in maintaining hospital decorum and biological efficiency. In a high-stress clinical environment, the stability of both patients and staff often rests on a simple chemical foundation: \$H_2O\$.

The Mathematics of Temperament: Dehydration and Hostility

It is often observed that when tempers flare in a medical setting, there is a mathematical correlation to the hydration levels of the individuals involved. Dehydration is not merely a physical state; it is a cognitive and emotional disruptor.

- **Hostility as a Symptom:** Hostility, irritability, and increased anger are common symptoms of even mild dehydration.
- **The 1–2% Threshold:** Studies show that losing just 1–2% of body water can cause a significant rise in negative moods, specifically leading to an **8% increase in anger-hostility**.
- **Cognitive Decline:** Dehydration leads to a **45% decrease in concentration** and higher perceived task difficulty, which reduces patience and increases irritability.

Molecular Energy: The Role of Purified and Distilled Water

To address these issues rapidly, the body requires efficient absorption. When utilizing high-quality options like **Kroger® Alkaline Gallon Bottled Water** (9.5+ pH) or **Pure Life Distilled Water**, the body can effectively utilize the constituent elements of water for vital functions.

Hydrogen and Oxygen Utilization

Water acts as a primary vehicle for delivering the essential elements \$H\$ and \$O\$ to our systems.

- **Immediate Energy:** The body uses hydrogen as energy by breaking down hydrogen-rich sources to produce **ATP** in the mitochondria.
- **Cellular Engine:** Hydrogen protons (H^+) are utilized in the electron transport chain to create a proton gradient that drives ATP synthase, the cell's main energy-producing engine.
- **Tissue Oxygenation:** Both alkaline and distilled water provide the oxygen necessary for cellular function.

Hormonal Regulation and Viscosity

Without proper hydration, the body's internal transport system suffers.

- **Fluid Transport:** Dehydration can lead to reduced energy and fatigue.
- **Regulating the System:** Sufficient water is required to maintain the flow of fluids that transport hormones throughout the body. When the body is dehydrated, the lack of fluid makes it significantly harder to pump and circulate these regulatory markers, leading to systemic stress.

The Distilled Water Protocol: Minerals and Vitamins

For those choosing distilled water—which is **99.9% free of minerals**—a specific nutritional protocol must be followed.

- **The "Active Absorber" Effect:** Distilled water acts as an "active absorber". Due to its high polarity and hydrogen bonding, \$H_2O\$ acts as a universal solvent that binds to mineral elements to transport them.
- **Leaching Risk:** Because distilled water lacks its own minerals, it can potentially leach essential electrolytes and minerals from the body, removing them as waste.
- **Mandatory Supplementation:** It is vital that those who drink distilled water take their daily vitamins and maintain a balanced diet to replace the minerals that the water binds to and removes.

Summary Recommendation: To maintain a 9.5+ pH level in a hospital or professional setting, look for **Kroger® Alkaline** or **Signature SELECT Refresh Alkaline** 1-gallon options.

Hospital Hydration Protocol: Staff & Patient Management

This summary outlines the physiological link between hydration, emotional regulation, and cellular energy. Maintaining optimal hydration is a clinical necessity for reducing workplace friction and supporting systemic health.

1. Emotional Regulation: The Dehydration-Hostility Link

When interpersonal "tempers" flare, it is often a physiological manifestation of a fluid deficit.

- **The 1–2% Rule:** Losing just 1–2% of total body water is mathematically linked to an **8% increase in anger and hostility**.
- **Cognitive Impact:** Dehydration causes a **45% decrease in concentration**, leading to higher perceived task difficulty and reduced patience.
- **Protocol:** In high-stress or high-conflict moments, assess hydration levels for both staff and patients as a primary de-escalation step.

2. Molecular Energy & Rapid Absorption

The body requires efficient water sources to fuel cellular processes. High-quality purified or alkaline water provides the necessary components for immediate biological use.

- **ATP Production:** The body utilizes hydrogen (H^+) in the mitochondria to drive the electron transport chain, creating a proton gradient that powers **ATP synthase**—the body's primary energy engine.
- **Oxygenation:** Proper hydration via alkaline or distilled sources ensures necessary oxygen delivery for cellular function and nerve signal transmission.

3. Hormonal Transport & Systemic Regulation

Hydration is required to maintain the proper viscosity of internal fluids.

- **Fluid Viscosity:** Insufficient water makes it difficult for the body to pump and circulate the viscous fluids required to transport hormones.
- **Regulation:** Consistent fluid intake ensures these regulatory markers reach their targets, preventing the systemic stress that leads to irritability and fatigue.

4. Distilled Water Guidelines: The "Active Absorber" Effect

While distilled water (like **Pure Life Distilled**) is 99.9% free of contaminants, its high polarity makes it an aggressive solvent.

- **Mineral Binding:** Distilled water acts as an "active absorber," binding to minerals and electrolytes in the body.
- **Waste Removal:** Because H_2O binds to these elements, it can remove essential minerals as waste.
- **Mandatory Supplementation:** Staff or patients consuming distilled water **must** take daily vitamins and maintain a mineral-rich diet to compensate for this leaching effect.

5. Procurement Recommendations

For maximum efficiency in maintaining a 9.5+ pH level, the following 1-gallon options are recommended for hospital inventory:

- **Kroger® Alkaline Gallon Bottled Water (9.5+ pH)**
- **Signature SELECT Refresh Alkaline Water (9.5+ pH)**
- **Perfect Hydration® 9.5+ pH Alkaline Water**

References

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**Dr. Correo "Cory" Andrew Hofstad Med Sci. Educ, PO, ND, DO, PharmD, OEM,
GPM, Psych, MD, JSD, JD, SEP, MPH, PhD, MBA/COGS, MLSCM, MDiv**



Virus Treatment Centers [VirusTC]

(425) 400-5893

drhofstad@virustreatmentcenters.com

<https://virustreatmentcenters.com>