Lecture 75:

Endurance Athletes Diet

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Who needs endurance diet?

- **Athletes who engage in moderate –to-high intensity exercise lasting over 90 minutes or an exercise in which aerobic system is used over 50%.**

Abazar`s Endurance Grading System:

Aerobic System Used	Endurance Level	Endurance Diet	Carbohydrate Loading
0 - 25%	+	No	No
26% - 50%	++	No	Yes
51% - 75%	+++	Yes	Yes
76% - 100%	++++	Yes	Yes

Fluid intake:

- **It is highly important for endurance athletes to stay fully hydrated for an optimal performance.**

- **Dehydration and over hydration decrease athletic performance.**

- **Most fluid loss in endurance athletes are through insensible loss (skin and lung).**

Benefits of proper hydration are:

- 1) to improve performance.
- 2) to protect them against heat – induced illnesses:

 - heat exhaustion.

 - heat stroke.

 - heat cramps

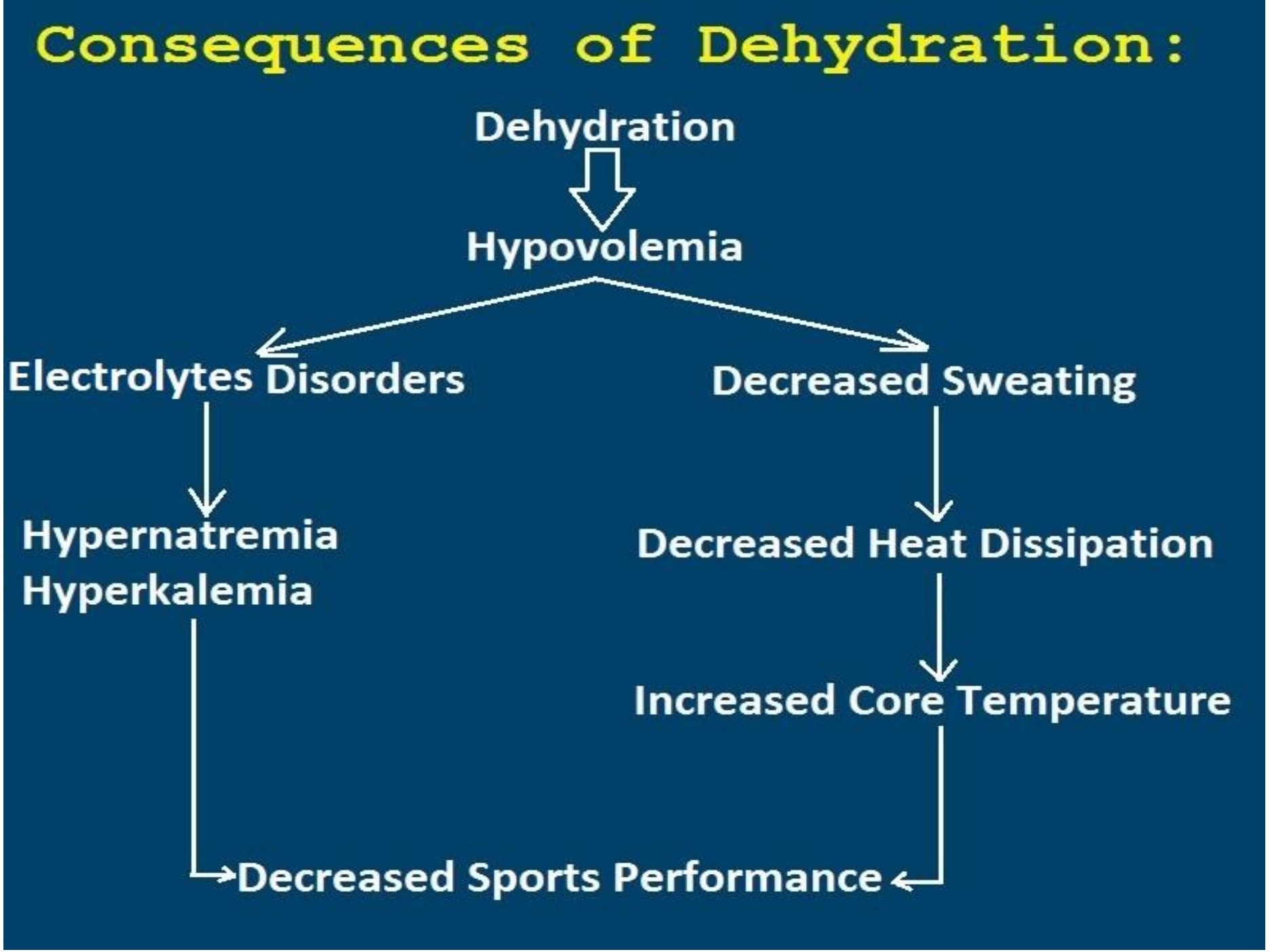
- 3) to improve oxygenation.

Dehydration:

- **It refers to body water loss from a hyperhydrated state to euhydrated or from euhydrated downward to hypohydrated state.**

- **In a moderate exercise for over 60 minutes, you may loss up to 1 liter by sweating only.**

- **Even a minimal dehydration (1-2% of body weight loss) can deter athletic performance.**


Consequences of Dehydration:
Dehydration
Hypovolemia
Electrolytes Disorders
Decreased Sweating
Hypernatremia
Hyperkalemia
Decreased Heat Dissipation
Increased Core Temperature
Decreased Sports Performance

Rehydration:

- **Adequate hydration provides the most effective defense against heat stress.**

According to American College of Sports Medicine:

- **1) Pre – exercise hydrating should be started several hours before.**

- **2) The goal is to prevent excessive dehydration (>2% body weight loss).**

- **3) During exercise, consuming beverages containing electrolytes and carbohydrates generally provides benefits over water alone.**

A simple guideline would be as follow:

- - Drink at least 2 liters throughout the day.
- - 2 hours before exercise: 2 glasses of water.
- - 1 hour before exercise: 1 glass of water.
- - 30 minutes before exercise: 1 glass of water.
- - 20 minutes before exercise: 1 glass of water.
- - 10 minutes before exercise: 1 glass of water

Electrolytes Replacement:

- **Added sodium and dextrose may benefit rehydration followed by athletic performance.**
- **Use ORS (Oral Rehydration Solution) powder formulated by WHO/UNICEF.**
- **Using ORS is the best way to replace electrolytes.**

WHO/UNICEF ORS salt Formula:

- **2.6 grams of salt (sodium chloride).**
- **2.9 grams of trisodium citrate.**
- **1.5 grams of KCL (potassium chloride)**
- **13.5 grams of glucose**

It is mixed with <u>one liter of water</u>.

ORS is commercially available in drug stores.

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4,9 g

Powder for solution
Poudre pour solution

NPN 01931563

Gastrolyte®

Oral Rehydration Salts (with citrate)
Sels de réhydratation pour solution orale (avec citrate)

DIARRHEA THERAPY
TRAITEMENT DE LA DIARRHÉE

Medicinal Ingredients / Ingrédients médicinaux :	Sachet
Dextrose Monohydrate / Monohydrate de dextrose	3,56 g
Disodium Citrate / Citrate disodique	0,53 g
Sodium Chloride / Chlorure de sodium	0,47 g
Potassium Chloride / Chlorure de potassium	0,30 g

Non-medicinal Ingredients: aspartame (as sweetening agent), colloidal silica
Ingrédients non médicinaux : aspartame (édulcorant), silice colloïdale.

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417074

6 Lot. Exp.
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If you did not have access to WHO - approved ORS, here is how you could make your own solution:

- **1 liter of water**
- **6 teaspoons of sugar.**
- **½ teaspoon of salt.**

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Calories Intake and Macronutrients Ratios:

- **Athletes who are actively engaged in endurance exercise and training eventually increase their calories intake to meet their demands.**

- **As we discussed before, the primary source of energy during an endurance event is carbohydrates followed by fats.**

Overall Dietary Guidance in Endurance Athletes:

- **Diet high in carbs and moderate in protein and fat.**
- **Carbs: 7 – 12 gr/kg/day**

- **7 gr/kg if he trains for 1 hour a day.**
- **8 gr/kg if he trains for 2 hours a day.**
- **9-10 gr/kg if he trains for 3-4 hours a day.**
- **10-12 gr/kg if he trains 4-6 hours a day**

- **Proteins: 1.4 – 1.6 gr/kg/day**
- **Fats: 1 gr/kg or 65 grams, whichever counts lower.**

- **Intense aerobic exercise for one hour decreases liver glycogen by about 60%, and an intense training for 2 hours almost depletes the content of glycogen in the liver and active muscle fibers.**

- **This is why an ideal pre-competition meal is required to maximize glycogen storages in the liver and muscles.**

In a pre-competition meal in endurance athletes, the meal should:

- **1) contain 5 – 7 gr/kg of carbs either in liquid or solid forms.**
- **2) be eaten about 2 – 3 hours before training or competition.**
- **3) contain small amounts of fat and fiber to adjust gastric emptying and prevent GI distress.**

What types of foods?

When individualizing pre-competition meal, consider the following three factors:

- **1) athlete`s food preference.**
- **2) digestibility of foods.**
- **3) alkalinity of foods.**

Abazar`s Ranking System for Complex Carbohydrates Prior to Exercise or Competition:

Rank	Complex Carbohydrates
1	Sweet Potatoes, and Yams
2	Baking Potatoes
3	Quinoa, and Legumes
4	Pasta, Noodle, Brown Rice, Oats, Buckwheat, and Cereals
5	Breads, Crackers, and Semolina
6	Corn, and Rye
7	Barley, and White Rice

Pre – Competition Carbs Loading:

- **We have discssed carb loading before.**

- **In endurance athletes, always do carb loading before the competition.**

- 3 days protocol (I prefer this one personally).

- 1 day protocol.

- **Pre – competition meal cannot correct existing nutritional deficiencies or inadequate nutrient intake during the weeks before competition.**

- **Endurance athletes require a balanced diet providing all macro and micro nutrients.**

- **You can recommend them high quality multivitamins-multiminerals.**

Endurance Supplementations:

When suggesting endurance supplementation, consider the following four factors:

- **1) Start supplementation at least 4 months before (6 months is ideal).**

- **2) Never go with a single product.**

- **3) Always go with a protocol, a combination of at least 3 products with different functions.**

- **4) Add an "adaptogen" to the protocol from 2 weeks before competition until the end of competition.**

Supplements for Endurance Athletes:

- 1) L – Carnitine.
- 2) MCTs (medium chain triglycerides).
- 3) Astaxanthin.
- 4) Beta – Alanine.
- 5) Cordyceps sinensis
- 6) Omega – 3 fatty acids.

- **7) Pyruvate.**
- **8) Citrulline.**
- **9) Glutamine.**
- **10) BCAAs.**

Homework:

- **1) Describe how dehydration could negatively affect athletic performance.**

- **2) Describe how you supplement a marathon runner and explain briefly the mechanisms of the products.**