

Cooling break in Football

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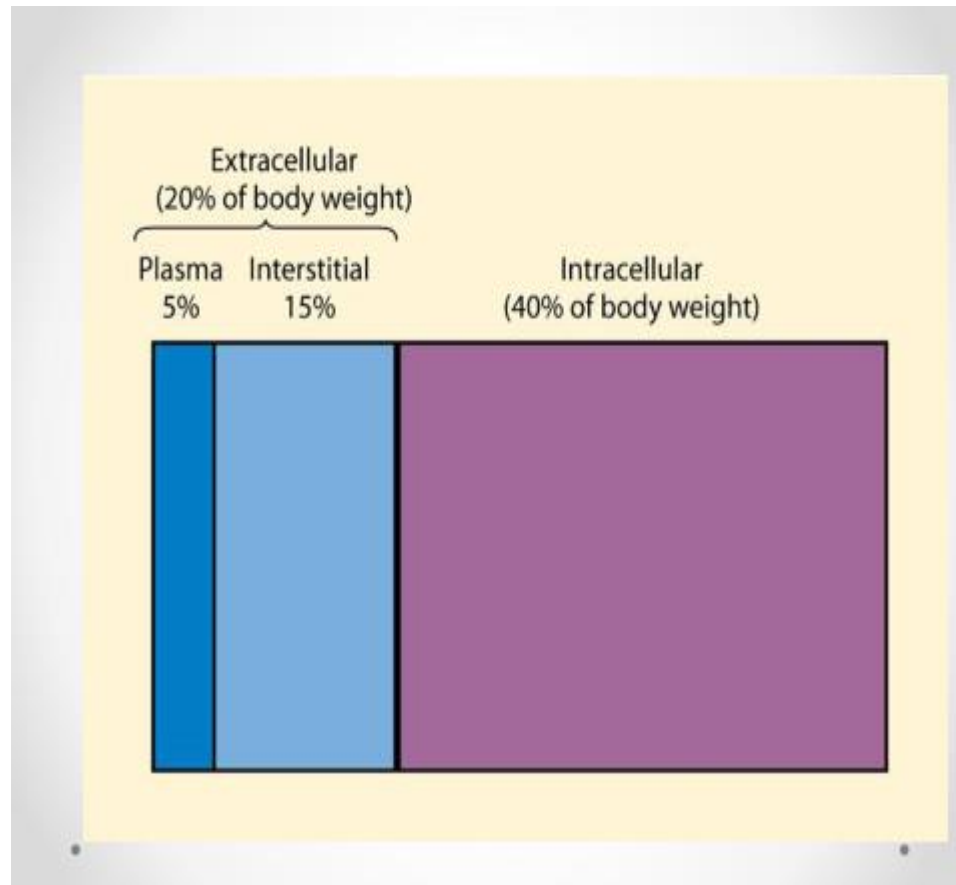
2022 FIFA World Cup(Qatar)

The scheduling of the tournament during the summer months, where temperatures often exceed 40C, is a big concern.



Introduction

Water is the largest constituent of the human body, accounting for around **60% of the weight of the human body**.



Water Content of Various Body Tissues for an Average 75-kg Man

Tissue	% Water	% of Body Mass	Water per 75 kg (in Liters)	% of Total Body Water
Skin	72	18	9.7	22
Organs	76	7	4.0	9
Skeleton	22	15	2.5	5
Blood	83	5	3.1	7
Adipose	10	12	0.9	2
Muscle	76	43	24.5	55

Heat and Sweat Production During Exercise

- **Exercise increases core temperature.**

For every L of O₂ consumed during exercise ~5 kcal is produced but **only a little is used for mechanical work** – the rest is heat.

Evaporate 1 liter sweat =580 Cal heat.

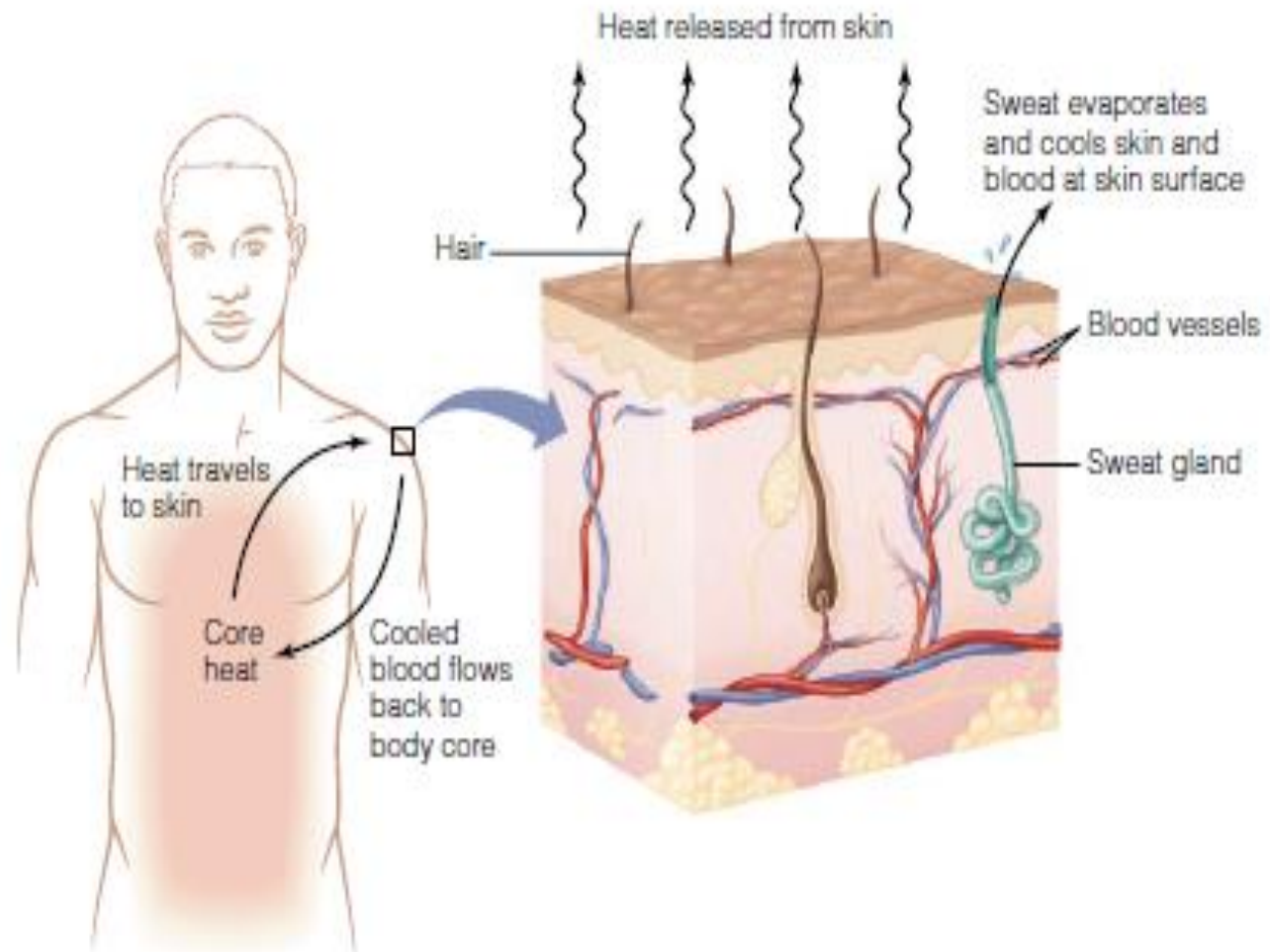


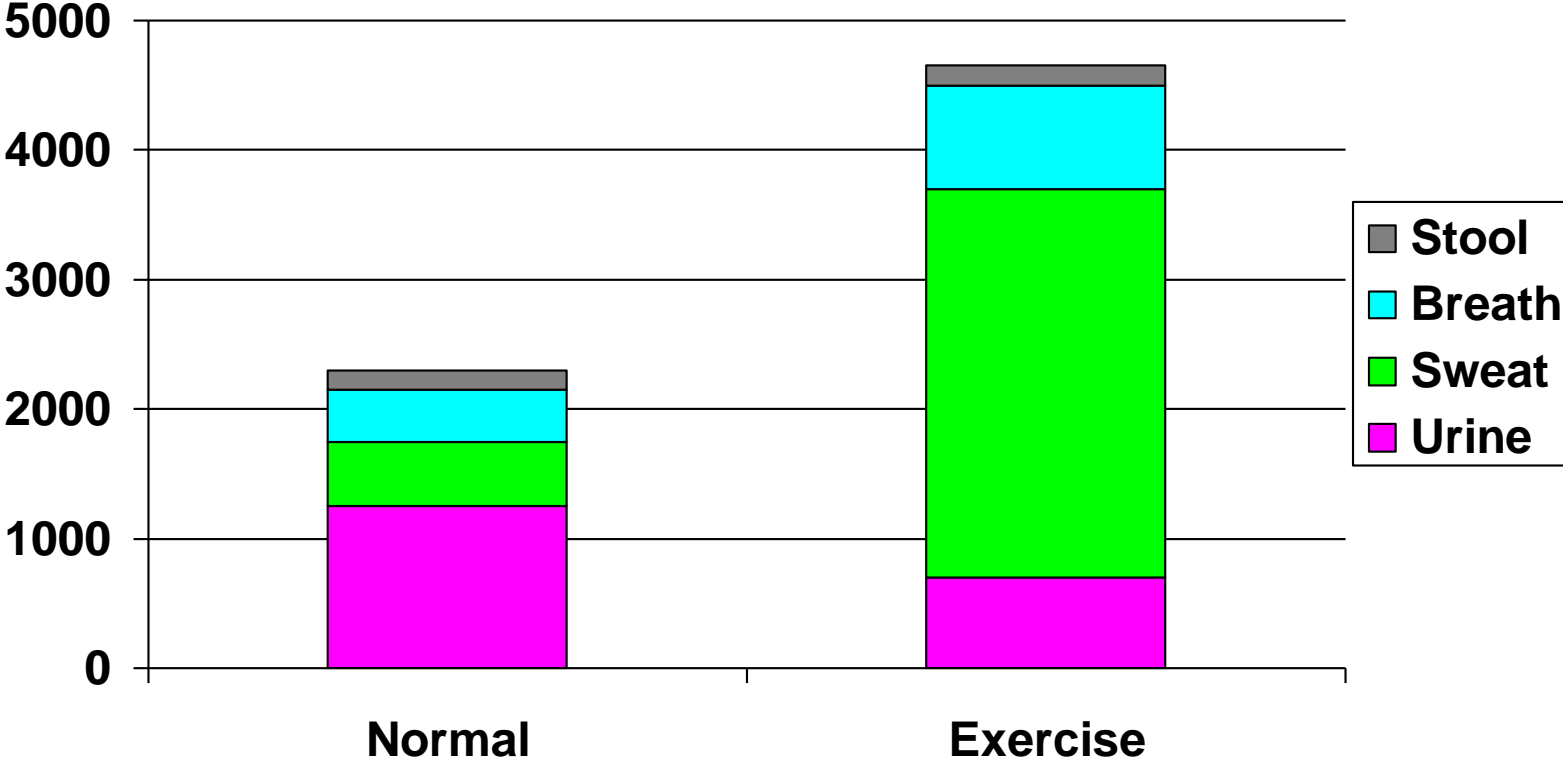
Figure 9.3 Evaporative cooling occurs when heat is transported from the body core through the bloodstream to the surface of the skin. The water evaporates into the air and carries away heat. This cools the blood, which circulates back to the body core, reducing body temperature.

Table 2. Sweating Rates for a Variety of Sports

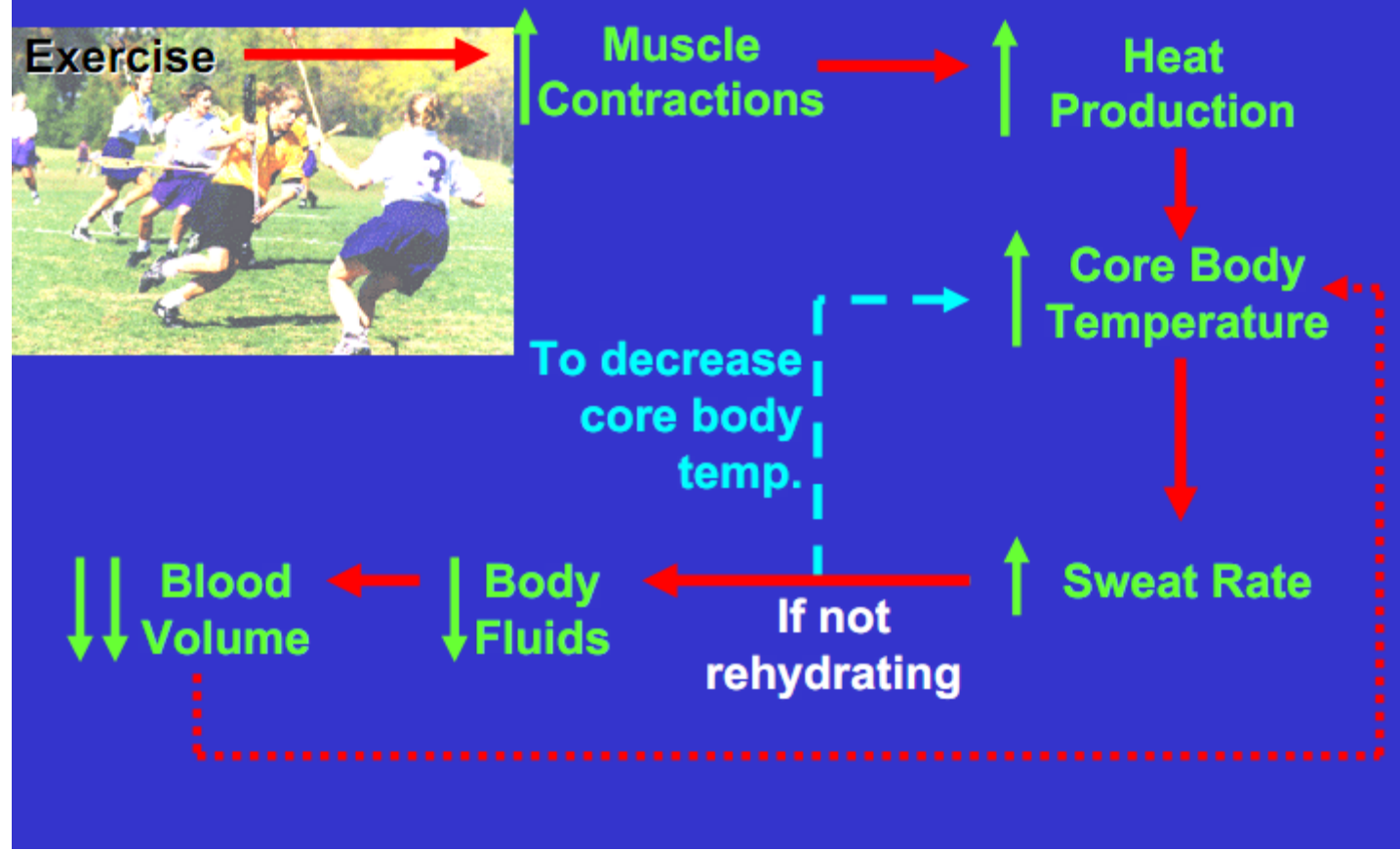
Sport	Mean	Range
	<i>L/h</i>	
Water polo	0.55	0.30 to 0.80
Cycling	0.80	0.29 to 1.25
Cricket	0.87	0.50 to 1.40
Running	1.10	0.54 to 1.83
Basketball	1.11	0.70 to 1.60
Soccer	1.17	0.70 to 2.10
Rugby	2.06	1.60 to 2.60

Data are from Rehrer and Burke, 1996.⁴²

Water Output: Normal vs. Exercise



Dehydration: What Happens During Exercise?



If the water loss exceeds fluid intake, **hypohydration** leading to dehydration will occur.

Dehydration is defined as a **2%** loss of **euhydrated** body weight.

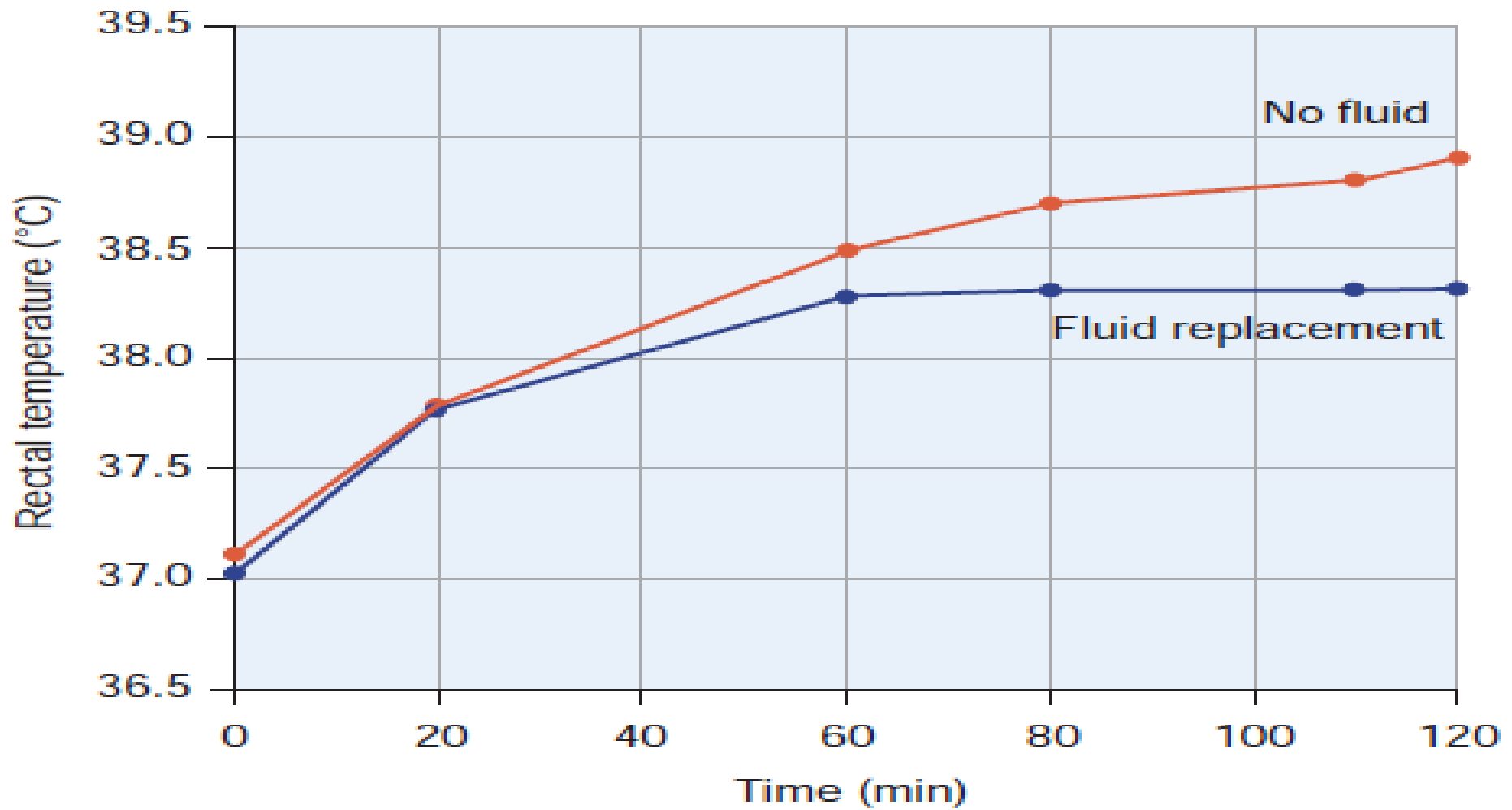
Dehydration negatively impacts **athletic performance**..

Dehydration: The Signs

% BODY WEIGHT LOSS	SIGNS
2%	↓ TEMP CONTROL ↑ HEART RATE
3%	10% ↓ MUSCLE PERFORMANCE
4-6%	↓ MUSCLE STRENGTH ↓ HAND-EYE CO-ORDINATION
+ 6%	↓ BLOOD VOLUME ↑ RESPIRATION RATE NAUSEA & CONFUSION
+ 10%	HEAT STROKE & FAINTING EXHAUSTION



National Football League all-star Korey Stringer died in 2001 as a result of heat stroke.



◀ min = minutes
C = Celsius

Figure 7.10 Rise in Rectal Temperature during Exercise.



Numerous varieties of bottled water are available to consumers.



G Series introduced in 2010, from left to right:
Gatorade Prime 01 (pre-game fuel)
Perform 02: Gatorade Thirst Quencher (original Gatorade)
Perform 02: G2 (low-calorie version of original Gatorade)
Gatorade Recover 03 (post-workout Gatorade with additional protein)

Preventing Dehydration & Sports Performance

Right amount of electrolytes

Stimulates fluid absorption

Enhances taste

Promotes fluid balance

Helps body to "hold" onto water

Avoid Hyponatremia

Decreases cramping



Keeping cool

The premise of the “cooling break” is to **reduce the risk of (HRIs)** heat-related illnesses (such as, heat cramps, heat exhaustion & heatstroke).



History



وقفه خنک شدن

۴ فاکتور مختلف آب و هوایی:

- درجه حرارت مطلق
- نور خورشید
- وزش باد
- رطوبت هوا

ترکیب این چهار عدد پارامتری را در اختیار ما قرار می دهد که با دستگاهی به نام (Wet Bulb Globe Temperature) WBGT محاسبه می شود.

در صورتی که عدد دستگاه یک ساعت قبل از شروع بازی به بالای ۳۲ برسد، سه دقیقه وقفه خنک شدن **Cooling Break** به داور پیشنهاد و در دقایق ۳۰ و ۷۵ با نظر او اعمال می شود.

نکته: عدد ۳۲ دمای مطلق هوا نیست درجه حرارت مطلق هوا معمولاً چندین درجه از این عدد بالاتر است.





به چه روشی دمای بدن را پایین بیاوریم.
استفاده از حوله های مرطوب

نوشیدن مایعات



سایه بان های متحرک

