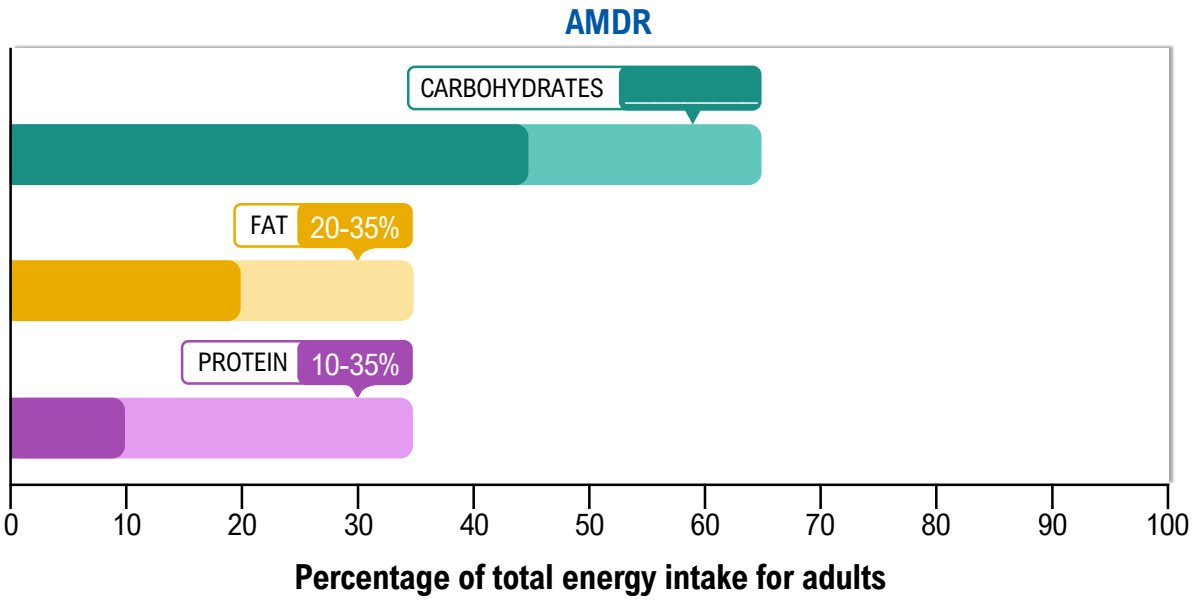
TOPIC: WHY DO WE NEED CARBOHYDRATES?

Carbohydrates Are Required in Our Diet

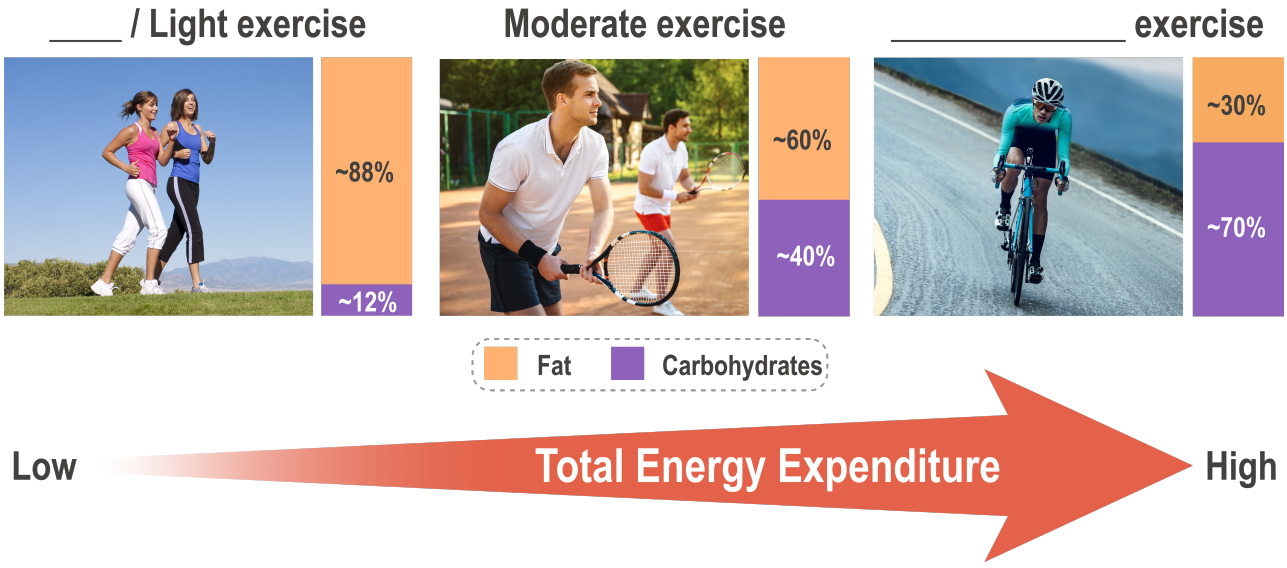
- It's recommended that carbohydrates make up _____-_____% of your total *daily* energy intake.
- Why are carbohydrates required? There are several reasons including that they can:

Provide Energy	Prevent Ketoacidosis	Spare Proteins	Provide Health Benefits (Fiber)



Carbohydrates Provide Energy

- Our bodies *ALWAYS* use some _____ of carbohydrates & fats to fuel daily activities.
  - Fats typically preferred with _____ intensity activities, while carbs are preferred with _____ intensity.
- Red blood cells rely *exclusively* on _____ for energy & nervous tissue (e.g. brain) *primarily* depends on it.



TOPIC: WHY DO WE NEED CARBOHYDRATES?

EXAMPLE

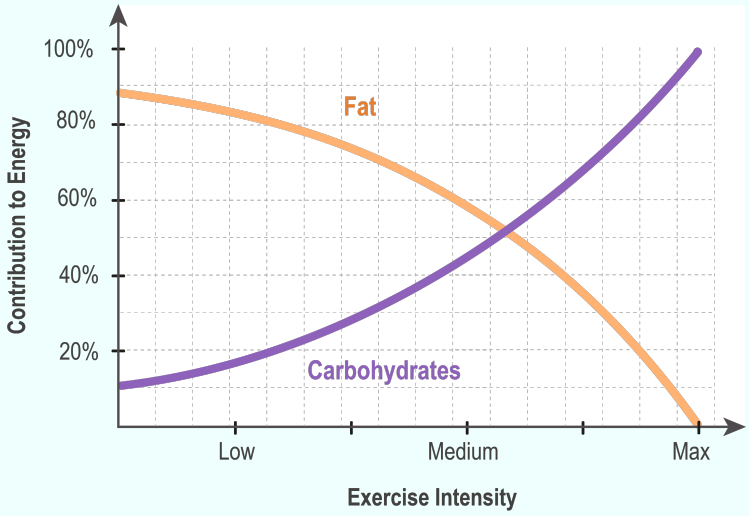
After analyzing the graph shown below, Declan claims that he can burn more fat by doing 20 minutes of light exercise (e.g. walking), than he can by doing 20 minutes of intense exercise (e.g. sprints). Is Declan correct?

a) Declan is correct, because light exercise burns a higher percentage of fat than high intensity exercise.

b) Declan is wrong; even though he could burn a greater proportion of fat compared to carbohydrate while walking, he will burn more fat doing interval training because the total energy expenditure is far greater.

c) Declan is wrong; light exercise such as walking won't burn any fat.

d) Declan is wrong; 20 minutes isn't enough time to burn any fat, no matter what you're doing.



PRACTICE

Which of the following is NOT a reason that we need carbohydrates in our diet?

a) Carbohydrates are our primary source of energy.

b) They can help prevent ketoacidosis.

c) They are directly required to make hormones and enzymes.

d) Fibers, which include non-digestible carbohydrates like cellulose, provides multiple health benefits.

PRACTICE

Why is glucose the most important & biologically relevant carbohydrate?

a) It's the central carbohydrate in metabolism & energy production for nearly all life, including humans.

b) It provides the most energy/gram of any macronutrient.

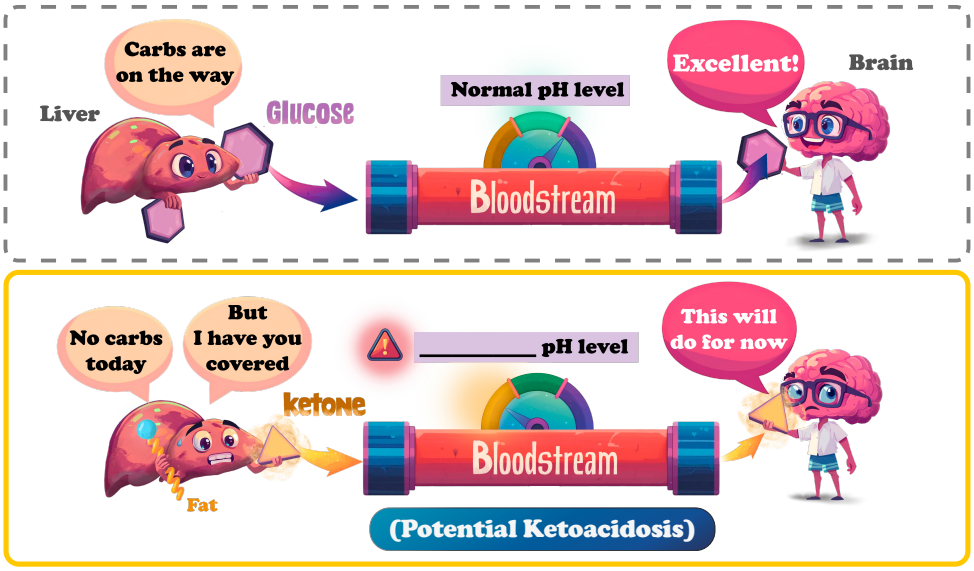
c) It is broken down into smaller molecules & stored in the liver.

d) It is the only type of sugar that humans can digest.

TOPIC: WHY DO WE NEED CARBOHYDRATES?

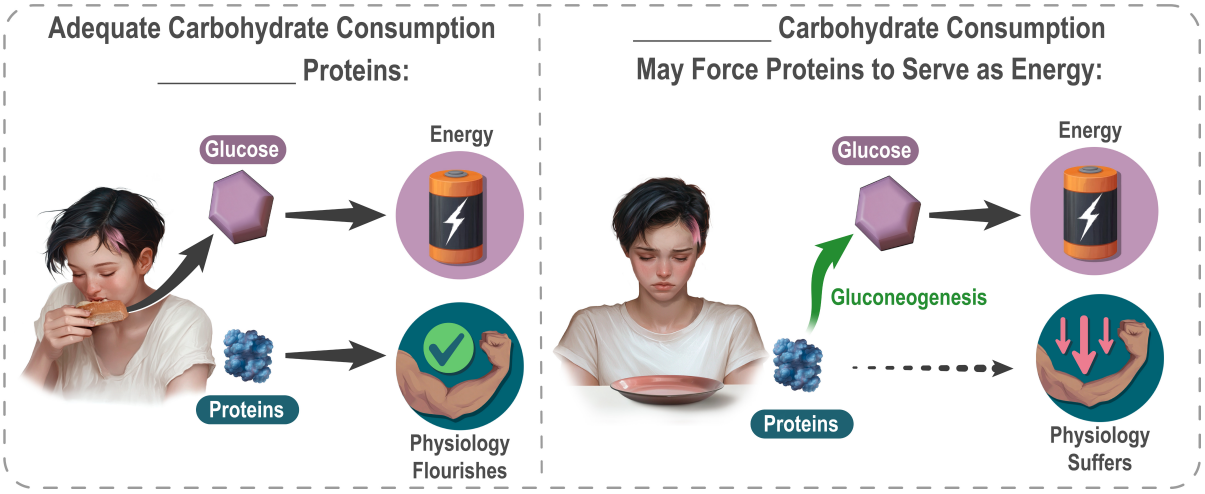
Carbohydrates Prevent Ketoacidosis

- Without adequate carbohydrate intake, the body relies more on other macronutrients for energy (e.g. fats, protein).
  - **Ketosis:** a normal, physiological state in which the body rapidly breaks down _____ into ketones.
  - **⚠ Ketones (Ketone Bodies):** acidic molecules that serve as an _____ fuel to glucose.
- Excessive accumulation of ketones over long periods of insufficient carbs can lead to keto_____osis.
  - **Ketoacidosis:** a dangerous condition where excessive ketone production _____ blood pH.



Carbohydrates Help Spare Proteins From Being Used As Energy

- During long periods of low carbohydrates (e.g. starvation), the body must rely on _____ for energy.
  - Due to their critical functions, *proteins* are a "_____ resort" energy source, used only if carbs are very low.
- **Gluconeogenesis:** process that generates _____ from _____-carbohydrate sources (e.g. protein).
  - Allows proteins to serve as energy but _____ the amount of protein available for other vital functions.



TOPIC: WHY DO WE NEED CARBOHYDRATES?

EXAMPLE

A patient comes to you after they've been experiencing extreme fatigue, inability to concentrate, & shortness of breath. These symptoms began after they started a new diet that was recommended by their favorite social media influencer. The diet involves cutting out all carbohydrates when possible. What could your patient be suffering from?

a) High blood sugar.
c) Diabetes.
b) Ketoacidosis.
d) All of the above.

PRACTICE

Gluconeogenesis is the process of:

a) The body producing ketones as an alternative energy source when glucose levels are low.
b) Plants producing new glucose during photosynthesis.
c) The bonding of glucose molecules to form glycogen.
d) The body breaking down protein to form glucose when blood glucose levels are low.

PRACTICE

Which of the following cells/tissues/organs relies *exclusively* on glucose to function?

a) Red blood cells.
c) The brain.
b) White blood cells.
d) Skeletal muscles.

PRACTICE

Which of the following statements about the body's use of glucose is correct?

a) Excess carbohydrates are converted to amino acids when we need to store energy.
b) Ketosis is the process of breaking down protein into glucose to provide energy.
c) During low intensity activity, the body uses a greater proportion of carbohydrate than fat for energy.
d) None of the above.