

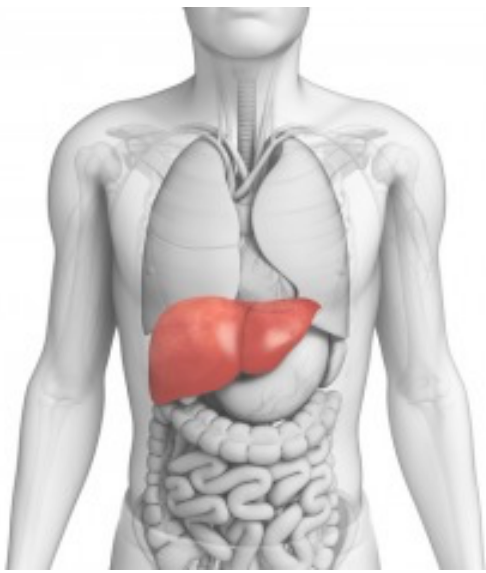
FASTING PHYSIOLOGY: GLUCOSE METABOLISM



METABOLIC PHASE II (4-6 HOURS)

Phase II begins approximately 4-6 hours after final caloric ingestion.

Glucagon stimulates glycogenolysis of hepatic glycogen to glucose. Hepatic glycogenolysis supplies 75% of the glucose needs while gluconeogenesis supplies 25%.



METABOLIC PHASE IV (2-5/7 DAYS)

Phase IV begins 48 hours after final caloric ingestion and lasts until approximately day 5-7.

Renal gluconeogenesis becomes progressively more important in maintenance of blood glucose levels. In adipocytes, glucagon stimulates the breakdown of triacylglycerols into fatty acids and glycerol. Glycerol is converted to glucose through gluconeogenesis.

Based on average nutrient reserves, a 154 pound human can sustain a fast of 2-3 months before entering starvation.

METABOLIC PHASE I (FED STATE)

Phase I begins immediately after caloric ingestion. Blood glucose is supplied by carbohydrate digestion into simple glucose molecules.

Glucogenic amino acids, glycerol, and lactate can be converted into glucose through gluconeogenesis in the liver and kidneys

METABOLIC PHASE III (1-2 DAYS)

Phase III begins approximately 24 hours after final caloric ingestion when hepatic glycogen reserves are depleted.

Gluconeogenesis, primarily in the liver, supplies blood glucose.



METABOLIC PHASE V (7 DAYS AND ONWARD)

Phase V begins when rates of ketogenesis exceed gluconeogenesis, and continues until starvation begins. During this phase, the glucose need of approximately 80 grams/day continues to be supplied by gluconeogenesis. Starvation begins when essential protein is catabolized to meet energy needs.