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Period _____

Date _____

SECTION
28.3

INTERACTIONS AMONG SYSTEMS
Reinforcement

KEY CONCEPT Systems interact to maintain homeostasis.

In the human body, all of the organs interact with one another, regulated by feedback mechanisms. Each organ system communicates with other organ systems through chemical messages and nerve impulses. For example, in vitamin D production, the skin, circulatory system, liver, kidneys, and endocrine system all work together to produce a form of vitamin D the body can use to build strong bones. If any organ fails to do its job, the level of vitamin D in the body decreases.

Interaction among organs is also important in **thermoregulation**. Maintaining a steady internal body temperature requires the coordination of the skin, hypothalamus, circulatory and respiratory systems, muscular system, and nervous and endocrine systems. Sensors from the skin and blood vessels send information to the hypothalamus, which then sends messages through the nervous and endocrine systems to the sweat glands, respiratory and circulatory systems, and muscle systems.

Homeostasis can be disrupted for several reasons, such as change occurring too rapidly, target organs failing to respond to signals, or disease changing the body's chemistry. A disruption of homeostasis can begin in one organ or organ system and result in a chain reaction that affects other organs and organ systems. These effects can be short term or long term. The common cold, for instance, will disrupt homeostasis for only a few days. Chronic conditions such as diabetes, however, represent a long-term disruption that can result in the failure of several organs.

1. Why it is important that organs and organ systems in the body work closely together?

2. How do organs and organ systems communicate with one another?

3. What organ systems interact to maintain a steady internal body temperature?

4. What is the effect on the body of a short-term disruption of homeostasis? of a long-term disruption?

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