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# **NUTRITION**

## **NBNSC-CNSC**

**NBNSC Certified Nutrition Support Clinician (CCN)**



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# Latest Version: 6.0

## Question: 1

The innermost lining of the heart is which of the following?

- A. myocardium
- B. endocardium
- C. pericardium
- D. apex

**Answer: B**

Explanation:

The correct answer to the question about the innermost lining of the heart is the **endocardium**. The endocardium is a thin layer of endothelial tissue that lines the interior of the heart chambers and heart valves. Its main function is to provide a smooth and protective lining of the cardiac chambers and valves, ensuring that blood flows smoothly within the heart without clotting.

In contrast, the other options mentioned refer to different parts of the heart's structure. The **myocardium** is the middle layer of the heart wall and consists of cardiac muscle tissue. It is responsible for the pumping action of the heart as it contracts and relaxes to circulate blood throughout the body. The **pericardium** is the fibrous sac that surrounds the heart and helps to protect it, maintaining its position in the thorax and providing a lubricated surface for the heart to move against. Lastly, the **apex** refers to the tip of the heart, which points downward and to the left, and is not directly related to the structural layers of the heart.

Thus, when considering the innermost lining of the heart, the endocardium is the accurate answer, distinguishing it from the myocardium, pericardium, and the apex, which have different roles in the anatomy and function of the heart.

## Question: 2

Which of the following are true about nutritional status?

- A. it never changes
- B. can affect the body's ability to resist disease
- C. is determined by hereditary factors
- D. is not reflected in one's appearance

**Answer: B**

Explanation:

To answer the question regarding which statements about nutritional status are true, let's analyze each statement provided:

"It never changes" - This statement is false. Nutritional status is not static; it can change due to various factors such as diet, health conditions, age, and lifestyle. For example, a person's nutritional status can improve with a balanced diet rich in vitamins and minerals or deteriorate due to a poor diet or disease.

"Can affect the body's ability to resist disease" - This statement is true. Nutritional status has a significant impact on the immune system. A well-nourished body is more capable of fighting off infections and diseases because it has the necessary resources to maintain a robust immune response. Conversely, malnutrition can weaken the immune system, making the body more susceptible to infections.

"Is determined by hereditary factors" - This statement is partially true. While genetic factors can influence aspects of nutritional status, such as predispositions to absorb certain nutrients more efficiently or risks for certain metabolic disorders, it is not solely determined by heredity. Environmental factors, dietary choices, and lifestyle also play critical roles in shaping one's nutritional status.

"Is not reflected in one's appearance" - This statement is false. Often, nutritional status can be reflected in one's physical appearance. Signs of poor nutrition might include dull hair, brittle nails, poor skin condition, and general lethargy. Conversely, good nutrition is often evident through a healthy appearance and vitality. However, it's important to note that appearances alone can be deceptive, as some individuals may not show visible signs of nutritional deficiencies or excesses.

In summary, the statement that nutritional status can affect the body's ability to resist disease is true and critical to understand. Nutritional status is dynamic and influenced by a combination of genetic, dietary, and environmental factors, and it often manifests in one's physical appearance. Recognizing the importance of nutrition in disease prevention and overall health is essential for making informed decisions about diet and lifestyle.

### Question: 3

As important as good nutrition is to health, a counselor should not lose sight of the fact that other practices can have a profound negative impact on health. They include all of the following except:

- A. cigarette smoking
- B. drinking plenty of water
- C. physical inactivity
- D. excessive alcohol

**Answer: B**

Explanation:

The question is about identifying which among the listed options does not have a negative impact on health. In the context of counseling and health, it's crucial to recognize both beneficial and harmful practices.

The first option, "cigarette smoking," is widely recognized as harmful. Smoking is a major cause of preventable diseases and deaths. According to the Centers for Disease Control and Prevention (CDC), smoking is responsible for more than 480,000 deaths per year in the United States, including deaths from direct smoking and secondhand smoke exposure. Smoking harms nearly every organ in the body, causes many diseases, and reduces overall health.

The second option, "drinking plenty of water," stands out as the only practice in the list that has a positive impact on health. Hydration is essential for maintaining bodily functions, including regulation of

body temperature, joint lubrication, and transport of nutrients. Adequate water intake is vital for good health, and it helps prevent conditions such as kidney stones, constipation, and urinary tract infections. The third option, "physical inactivity," is a known health risk. Lack of physical activity has been linked to numerous health problems, such as obesity, heart disease, diabetes, and some cancers. The World Health Organization (WHO) has identified physical inactivity as the fourth leading risk factor for global mortality, causing an estimated 3.2 million deaths globally each year.

The fourth option, "excessive alcohol," is also detrimental to health. Excessive alcohol consumption can lead to liver disease, heart disease, and certain types of cancer, as well as acute consequences like alcohol poisoning and accidents. The CDC notes that excessive alcohol use leads to approximately 95,000 deaths in the United States each year.

In conclusion, among the options provided, "drinking plenty of water" is the only one that does not have a negative impact on health and, in fact, is a recommended practice for maintaining good health. The other options—cigarette smoking, physical inactivity, and excessive alcohol—are all practices that can profoundly impact health negatively.

### Question: 4

A caliper is used to measure which of the following?

- A. height
- B. frame
- C. skinfold thickness
- D. lean tissue

**Answer: C**

Explanation:

A caliper is a versatile tool used in various measurements, but one of its specific applications is in measuring skinfold thickness. This measurement technique is particularly important in the fields of health and fitness, where it is used to estimate an individual's body fat percentage.

Skinfold thickness refers to the measurement of the layer of fat just under the skin, known as subcutaneous fat. By measuring the thickness of this layer at specific locations on the body, health professionals can estimate the total body fat of a person. These measurements are taken at standardized points on the body, which can include areas like the abdomen, triceps, back, and thigh. The process involves pinching the skin and fat away from the underlying muscle and bone and using the caliper to measure the thickness of the pinched fold. Calipers are designed to apply a standardized pressure to the skinfold, which ensures that the measurements are consistent and reliable. The values obtained from these measurements are then used in equations or reference tables to estimate body fat percentage.

This method of estimating body fat is popular due to its cost-effectiveness and relative ease of use compared to other methods like hydrostatic weighing or DEXA scans. However, the accuracy of skinfold measurements can depend on the skill of the person conducting the assessment and the quality of the caliper used.

In summary, while calipers can be used for various measurements, including dimensions of objects in engineering and manufacturing, in the context of health and fitness, they are specifically utilized to measure skinfold thickness. This measurement helps in estimating the body fat percentage, which is a crucial component in assessing an individual's health and fitness status.

## Question: 5

When concentrated forms of minerals are taken on a regular basis, over a period of time and become more than the body can handle this results in which of the following?

- A. deficiency of the mineral
- B. rejection of the mineral
- C. inefficiency of the mineral
- D. toxicity of the mineral

**Answer: D**

Explanation:

When concentrated forms of minerals are taken on a regular basis, the body can accumulate these substances to levels that exceed its capacity to process and utilize them effectively. This situation can lead to a condition known as mineral toxicity. Minerals are essential nutrients needed in small amounts for health and proper functioning of the body. However, just like any nutrient, an excess can be harmful. Mineral toxicity manifests when the intake of a mineral consistently exceeds the body's requirement and its ability to excrete the excess. Different minerals have different thresholds for toxicity, and the severity of symptoms can vary based on the specific mineral involved and the level of excess. Common symptoms of mineral toxicity may include nausea, diarrhea, abdominal pain, and more severe effects like kidney damage, neurological disruptions, or cardiovascular problems depending on the mineral and the extent of exposure.

It's important to note that toxicity can also lead to interactions that affect the absorption and efficacy of other minerals. For example, an excess of one mineral might inhibit the absorption of another, potentially leading to a deficiency in the inhibited mineral even when its intake would normally be adequate. This complex interplay can disrupt the overall nutritional balance and contribute to various health issues.

Because of these risks, it is advised that concentrated forms of minerals, such as supplements, be taken only under medical guidance. A physician can provide personalized advice based on individual health needs, current diet, and existing medical conditions. They can help determine the appropriate dosage to avoid the risk of toxicity and ensure that the supplementation is beneficial rather than harmful. This approach is crucial for maintaining optimal health and preventing the negative outcomes associated with excessive mineral intake.

## Question: 6

Which of the following is NOT a mediator cell that releases substances that mediate immune reactions?

- A. mast cell
- B. basophil
- C. platelet
- D. barrier epithelial cell

**Answer: D**

Explanation:

\*The question asks which of the listed options is NOT a mediator cell that releases substances involved in immune reactions. The correct answer is "barrier epithelial cell." To understand why this is the correct choice, it is essential to clarify the roles of the different options provided and their involvement in immune responses. \*

\*Mast cells, basophils, and platelets are all types of cells that play active roles in the body's immune response, primarily through the mediation of inflammation and allergic reactions. Mast cells and basophils are similar in that they both contain granules filled with histamine and other chemicals that are released during allergic and inflammatory reactions, leading to increased vascular permeability and smooth muscle contraction. These cells are typically involved in what is considered immediate hypersensitivity reactions. Platelets, while primarily known for their role in blood clotting, also secrete inflammatory mediators that can influence the immune system and vascular responses. \*

\*In contrast, barrier epithelial cells, which include those that line the skin and mucous membranes, do not primarily function as mediators releasing substances that drive immune reactions. Instead, their primary role is to act as a physical barrier that protects internal tissues from external pathogens, chemicals, and physical insults. While epithelial cells can contribute to immune responses indirectly (for example, by secreting antimicrobial peptides and signaling molecules that alert immune cells to the presence of a pathogen), they are not typically involved in the active mediation of immune reactions through the release of substances like histamine or other pro-inflammatory mediators. \*

\*Therefore, when comparing the roles of mast cells, basophils, platelets, and barrier epithelial cells, the correct answer to the question is "barrier epithelial cell." This choice is the only one among those listed that does not fit the description of a mediator cell actively participating in the release of substances that mediate immune reactions. Instead, barrier epithelial cells serve more as a physical and chemical line of defense, maintaining the integrity of the body's barriers and providing signals that help coordinate the broader immune response.

## Question: 7

Up to 20 mcg/100 ml of plasma Carotene in all ages is considered:

- A. deficient
- B. marginal
- C. acceptable
- D. none of the above

**Answer: A**

Explanation:

The question pertains to the categorization of plasma carotene levels and their interpretation in terms of nutritional status. Plasma carotene levels are used as a biomarker for vitamin A status as well as overall intake of carotenoid-rich fruits and vegetables. Carotenes are converted by the body into vitamin A, which is essential for vision, growth, and immune function.

According to the information provided, plasma carotene levels up to 20 mcg/100 ml for all ages are considered deficient. This implies that such low levels indicate an inadequate intake of carotenoid-containing foods, potentially leading to vitamin A deficiency if not addressed. This is critical as vitamin A

deficiency can result in severe health problems, including impaired vision (night blindness), an increased risk of infection, and in severe cases, blindness.

The question then mentions a "marginal" status for plasma carotene levels between 20-39 mcg/100 ml for all ages, and specifically for pregnant women, a marginal status is considered for levels between 40-79 mcg/100 ml. Marginal status suggests that while the levels are not low enough to be classified as deficient, they are not optimal and could benefit from nutritional improvement to prevent potential health issues.

Furthermore, acceptable levels of plasma carotene are defined as 40+ mcg/100 ml for all ages, and 60+ mcg/100 ml specifically for pregnant women. These levels are considered sufficient and imply a healthy intake of carotenoids, suggesting a lower risk of vitamin A deficiency and associated health problems.

In context, if plasma carotene levels are up to 20 mcg/100 ml, it indicates a deficiency in carotene intake, which is critical for maintaining adequate vitamin A levels and overall health. Thus, the correct response to the question about the status of plasma carotene levels up to 20 mcg/100 ml being considered for all ages is "deficient." This highlights the need for increased consumption of carotenoid-rich foods or supplementation to achieve optimal health outcomes.

### Question: 8

Foods that are labeled organic need to have at least what percentage of organic ingredients except for added water and salt?

- A. 50%
- B. 65%
- C. 75%
- D. 95%

**Answer: D**

Explanation:

When a product is labeled as "organic," it must meet strict guidelines set by certifying organizations, such as the USDA in the United States. One of the key requirements for a food product to be labeled as "organic" is that at least 95% of its ingredients, excluding water and salt, must be organic. This means that these ingredients must be grown and processed using organic farming methods that exclude synthetic pesticides, herbicides, and chemicals.

The exclusion of water and salt from the calculation is because these are considered natural substances that do not usually undergo the same type of agricultural processing as other food ingredients.

Therefore, when calculating the percentage of organic ingredients, these are not considered in the total weight that needs to be organic.

Additionally, there are different labeling categories within organic certifications. For example, products that can claim they are "made with organic ingredients" need to contain at least 70% organic ingredients, again excluding water and salt. This allows for a slight flexibility compared to the stricter 95% requirement for a fully organic label.

These regulations are implemented to maintain the integrity of the organic labeling system and to provide consumers with standardized, reliable information about the organic status of the products they purchase. Meeting these requirements ensures that consumers are getting products that are substantially free from synthetic additives and are produced in a way that supports sustainable agricultural practices.

## Question: 9

All of the following are limitations of the 24-hour recall of food intake of an individual except:

- A. one recall is seldom representative of a person's usual intake
- B. under-reporting does not occur
- C. relies on memory
- D. omissions of dressings, sauces, and beverages can lead to low estimates of energy intake

**Answer: B**

Explanation:

To answer the question about the limitations of the 24-hour recall of food intake, it's essential to understand what each statement implies and identify which one is incorrect as a limitation.

The 24-hour dietary recall method is a commonly used dietary assessment tool where an individual recalls all the foods and beverages they consumed in the previous 24 hours. While this method is relatively easy to administer and requires less time compared to other methods like food records, it comes with several limitations.

One limitation is that "one recall is seldom representative of a person's usual intake." This statement is true because dietary habits can vary daily, and a single day's intake may not accurately reflect typical consumption patterns. Therefore, relying on a single 24-hour recall might not provide a comprehensive view of an individual's dietary habits.

The statement "under-reporting does not occur" is not correct as a limitation because, in reality, under-reporting is a significant limitation of the 24-hour recall method. Individuals often forget or deliberately omit certain foods or underestimate portion sizes, which can lead to inaccuracies in the data collected. Both under-reporting and over-reporting are common issues in dietary recall methods, affecting the reliability of the data.

Another limitation is the reliance on memory, as stated in "relies on memory." Since this method depends entirely on the individual's ability to recall their food intake accurately, it is susceptible to errors in memory. People may not remember every detail accurately, especially for incidental items like condiments, snacks, or beverages.

Lastly, "omissions of dressings, sauces, and beverages can lead to low estimates of energy intake" is also a true limitation. These items are often overlooked or forgotten when recalling what was eaten, yet they can significantly contribute to total caloric and nutrient intake. The omission of such items can result in underestimation of energy and nutrient consumption, which can skew research findings or dietary assessments.

In conclusion, the correct answer to the question is that "under-reporting does not occur" is the exception and not a limitation of the 24-hour recall method. All other options correctly describe limitations associated with this dietary assessment tool.

## Question: 10

Pectin and mucilage are soluble in water and form a gel that helps provide bulk for the intestines. They are useful because:

- A. they bind to cholesterol and reduce the amount that can be absorbed by the blood
- B. they are not soluble
- C. edible thickening agent
- D. A and C

**Answer: D**

**Explanation:**

It appears that the original text provided is somewhat disorganized and unclear. I will attempt to clarify and expand upon the information regarding the usefulness of pectin and mucilage, especially in the context of health benefits like cholesterol management, diabetes, and potentially preventing colon cancer.

Pectin and mucilage are natural substances found in many plants. Pectin is particularly abundant in the cell walls of fruits such as apples, while mucilage is found in plants like flax seeds and psyllium. Both of these substances are soluble in water, which means they can dissolve in water to form a gel-like substance. This gelatinous property allows them to serve as bulk-forming agents in the digestive system. When consumed, they absorb water and expand, which can help to regulate bowel movements and prevent constipation.

Beyond aiding in digestion, pectin and mucilage provide other significant health benefits. One of their primary advantages is their ability to bind to cholesterol in the digestive tract. This binding process helps to limit the amount of cholesterol that is absorbed into the bloodstream. By reducing the overall intake and absorption of cholesterol, pectin and mucilage can contribute to lower blood cholesterol levels, which is beneficial for heart health.

These substances are also valuable for individuals managing diabetes. The gel formed by pectin and mucilage in the digestive tract slows down the digestion process. This slower digestion rate moderates the absorption of glucose (sugar) into the bloodstream, preventing sharp spikes in blood sugar levels. Consistently managing blood sugar levels is crucial for people with diabetes, as it helps mitigate the risk of complications associated with the disease.

Additionally, there is some evidence to suggest that a diet high in fiber, including substances like pectin and mucilage, may help in preventing certain types of cancer, such as colon cancer. The mechanisms are thought to involve the promotion of a healthy digestive environment and the binding of potential carcinogens (cancer-causing substances) in the colon, thereby reducing their contact with the colon lining.

In summary, pectin and mucilage are not only useful as thickeners or edible agents in various food products but are also beneficial for health due to their cholesterol-binding properties, effectiveness in glucose management, and potential role in cancer prevention. This makes them particularly useful in dietary applications aimed at improving or maintaining health.

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