Alcohol and Nutrition

Nutrition serves two purposes. It provides energy. It also maintains body structure and function. Food supplies energy. It also provides the building blocks needed to replace worn or damaged cells. Alcoholics often eat poorly. This limits their supply of essential nutrients. This affects energy supply and structure maintenance. Alcohol also affects the body's nutrients in:

- Digestion.
- Storage.
- Using and getting rid of waste products.

IMPAIRMENT OF NUTRIENT DIGESTION AND UTILIZATION

- Once ingested, food must be broken down into small components (*digested*). Then it is available for energy. It helps maintain body structure and function. Digestion begins in the mouth. It continues in the stomach and intestines, with help from the pancreas. The nutrients from digested food are absorbed from the intestines into the blood. Then they are carried to the liver. The liver prepares nutrients for:
  - Immediate use.
  - Storage and future use.
- Alcohol inhibits the breakdown of nutrients into usable molecules.
  - It decreases secretion of digestive enzymes from the pancreas.
- Alcohol impairs nutrient absorption by damaging the cells lining the stomach and intestines.
- It also interferes with moving some nutrients into the blood.
- In addition, nutritional deficiencies themselves may lead to further absorption problems.
  - For example, folate deficiency changes the cells that line the small intestine. This impairs how water is absorbed. It also affects absorbed nutrients. These include glucose, sodium, and additional folate.
- Even if nutrients are digested and absorbed, alcohol can prevent them from being fully used. It changes their transport, storage, and excretion. Impaired utilization of nutrients by alcoholics is indicated by:
  - Decreased liver stores of vitamins such as vitamin A
  - Increased excretion of nutrients such as fat.

ALCOHOL AND ENERGY SUPPLY

- Three basic nutritional components found in food are:
  - Carbohydrates.
  - Proteins.
  - Fats.
- These are used as energy. Some alcoholics take in as much as 50 % of their total daily calories from alcohol. They often neglect important foods.
- Even when enough food is eaten, alcohol can impair the ways the body controls blood sugar (*glucose)* levels. It may either increase or decrease blood sugar.
  - In non-diabetic alcoholics, increased blood sugar (*hyperglycemia*) is caused by poor insulin secretion. It is usually temporary.
  - Decreased blood sugar *(hypoglycemia*) can cause serious injury even if this condition is short lived. Low blood sugar can happen when a fasting or malnourished person drinks alcohol. When there is no food to supply energy, stored sugar is used up. The products of alcohol inhibit forming glucose from other compounds such as amino acids. As a result, alcohol causes the brain and other body tissue to lack glucose. It is needed for energy and function.
- Alcohol is an energy source. But how the body processes and uses the energy from alcohol is complex. Also, when alcohol is substituted for carbohydrates, subjects tend to lose weight. This indicates that they get less energy from alcohol than from food.

ALCOHOL - MAINTAINING CELL STRUCTURE AND FUNCTION

Structure

Cells are made mostly of protein. So an adequate protein diet is important for maintaining cell structure. This is especially true if cells are being damaged. Research indicates that alcohol affects protein nutrition by causing impaired:

- Digestion of proteins to amino acids.
- Processing of amino acids by the small intestine and liver.
- Synthesis of proteins from amino acids.
- Protein secretion by the liver.

Function

Nutrients are essential for the body to function well. They provide the tools that the body needs to work well:

- Proteins.
- Vitamins.
- Minerals.

Alcohol can disrupt body function. It may cause nutrient deficiencies. And it may interfere with the way nutrients are processed.

Vitamins

- Vitamins are essential to maintain growth and normal metabolism. They regulate many of the body`s processes. Chronic heavy drinking causes deficiencies in many vitamins. This is caused by eating less. And, in some cases, vitamins may be poorly absorbed. For example, alcohol inhibits fat absorption. It impairs how the vitamins A, E, and D are normally absorbed along with dietary fats. Not enough vitamin A may cause night blindness. Not enough vitamin D may cause softening of the bones.
- Some alcoholics lack vitamins A, C, D, E, K, and the B vitamins. These are all involved in wound healing and cell maintenance. In particular, because vitamin K is necessary for blood clotting, lacking that vitamin can cause delayed clotting. The result is excess bleeding. Lacking other vitamins involved in brain function may cause severe neurological damage.

Minerals

Deficiencies of minerals such as calcium, magnesium, iron, and zinc are common in alcoholics. The alcohol itself does not seem to affect how these minerals are absorbed. Rather, they seem to occur secondary to other alcohol-related problems, such as:

- Less calcium absorbed.
- Not enough magnesium.
- More urinary excretion.
- Vomiting.
- Diarrhea.
- Not enough iron due to gastrointestinal bleeding.
- Not enough zinc or losses related to other nutrient deficiencies.
- Mineral deficiencies can cause a variety of medical consequences. These range from calcium-related bone disease to zinc-related night blindness and skin lesions.

ALCOHOL, MALNUTRITION, AND MEDICAL COMPLICATIONS

Liver Disease

- Alcoholic liver damage is caused primarily by alcohol itself. But poor nutrition may increase the risk of alcohol-related liver damage. For example, nutrients normally found in the liver are known to be affected by drinking alcohol. These include carotenoids, which are the major sources of vitamin A, and vitamin E compounds. Decreases in such nutrients may play some role in alcohol-related liver damage.

Pancreatitis

- Research suggests that malnutrition may increase the risk of developing alcoholic pancreatitis. Research suggests that a diet lacking in protein may increase alcohol's damaging effect on the pancreas.

Brain

- Nutritional deficiencies may have severe effects on brain function. These may be permanent Specifically, thiamine deficiencies are often seen in alcoholics. They can cause severe neurological problems. These include:
  - Impaired movement.
  - Memory loss seen in Wernicke/Korsakoff syndrome.

Pregnancy

- Alcohol has toxic effects on fetal development. It causes alcohol-related birth defects. They include fetal alcohol syndrome. Alcohol itself is toxic to the fetus. Also, the nutritional deficiency can affect how the fetus develops. That may compound the risk of developmental damage.
- Nutritional needs during pregnancy are 10 to 30 % greater than normal. Food intake can increase by as much as 140 % to cover the needs of both mother and fetus. An alcoholic mother`s nutritional problems may adversely affect the nutrition of the fetus. And alcohol itself can also restrict nutrition flow to the fetus.

NUTRITIONAL STATUS OF ALCOHOLICS

Techniques for assessing nutritional status include:

- Taking body measurements to estimate fat reserves. They include:
  - Weight.
  - Height.
  - Mass.
  - Skin fold thickness.

Performing blood analysis to provide measurements of circulating:

- Proteins.
- Vitamins.
- Minerals.

- These techniques tend to be imprecise. For many nutrients, there is no clear "cut-off" point that would allow an accurate definition of deficiency. So assessing the nutritional status of alcoholics is limited by these techniques. Dietary status may provide information about the risk of developing nutritional problems. Dietary status is assessed by:
  - Taking patients' dietary histories.
  - Evaluating the amount and types of food they are eating.
- It is difficult to determine what exact amount of alcohol begins to have damaging effects on nutrition. In general, moderate drinkers have two drinks or less per day. They seem to be at little risk for nutritional problems. Various medical disorders begin to appear at greater levels.
- Research indicates that the majority of even the heaviest drinkers have few obvious nutritional deficiencies. Many alcoholics who are hospitalized for medical complications of their disease do have severe malnutrition. Alcoholics tend to eat poorly. Often they eat less than the amounts of food necessary to provide enough:
  - Carbohydrates.
  - Protein.
  - Fat.
  - Vitamins A and C.
  - B vitamins.
  - Minerals like calcium and iron.

Of major concern is alcohol's effect on digesting food and use of nutrients. It may shift a mildly malnourished person toward severe malnutrition.

Information courtesy of :
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service. National Institutes of Health.

Document Released: 10/12/2006 Document Re-Released: 01/09/2011
ExitCare® Patient Information ©2011 ExitCare, LLC.