SCU
SICKLE CELL UNIT

Nutrition in SCD

There are several lines of evidence that suggest that nutrition is important in SCD. For example the chronic increased breakdown and production of red blood cells in sickle cell disease increases the rate at which body protein is broken down and rebuilt (protein turnover). Additionally, because the body has to work harder to ensure all the tissues get enough oxygen, the overall metabolic rate is increased. As a result, the body requirements for carbohydrates, protein and fats are higher in SCD compared to the average person. The consequences of the increase nutritional requirements are varied but include delays in growth and maturation, and thinness (a body mass index or BMI <18.5 kg/m^2), which is more common in adults with SCD. It is generally accepted that persons who are thin tend to have more complications when they are ill.

In addition to the global increased requirements for energy and protein there appears to be an increase in the specific demands for various nutrients. Some of these are:

- Amino acids –arginine, citrulline, and praline.
- Minerals & trace elements – magnesium and zinc.
- Fatty acids - n3-fatty acids, short chain fatty acids.
- Vitamins - vitamin E and folic acid.

Another abnormality that has been described in SCD and which may respond to nutritional intervention is increased oxidative stress. This occurs when oxidative molecules which are by-products of normal metabolism are produced in excessive amounts. Oxidative molecules are neutralized by antioxidant molecules. Failure to neutralize oxidative molecules results in damage to cells which can lead to worsening of the illness. There is a large body of literature which has reported that the antioxidant capacity of red blood cells of individuals with SCD is low. The importance of this observation is that, oxidative damage of the red cell membrane of persons with SCD alters the ability of red cells to bend .This contributes to the formation of sickle shaped cells that can cause blockage of blood vessels in different organs in the body. Therefore eating foods that increase the antioxidant capacity of individuals may be beneficial in SCD.

Individuals with SCD are encouraged to choose a diet with a wide variety of foods from all food groups each day. Each day include items from **starches** (eg. yam, potato, breadfruit, rice), **protein** (eg. red meat, fish, chicken), **fruits** (eg. mango, oranges, banana, tomato), **vegetables** (eg. carrot, lettuce), **dairy products** (eg. milk, cheese) and **fats** (eg. fish oil, margarine, butter).

Often times during a painful episode the appetite will be poor. If this occurs one can take protein-energy supplements.