

**Diet and nutrition**

**in sickle cell disease**

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**Fluids**

**Energy**

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**Weight**

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**Future directions**



All children need to think about the things that they eat, but this is even more important for children with sickle cell disease.

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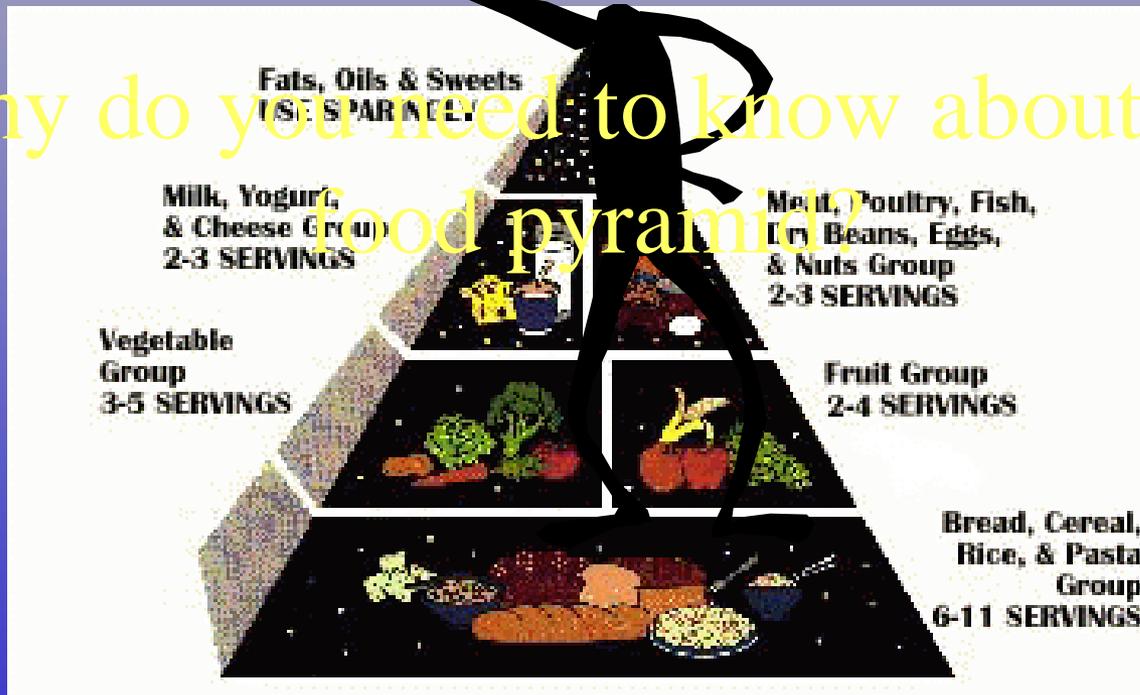


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Many nutrition experts talk about the “food pyramid.” It looks like this:

Why do you need to know about the food pyramid?



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Good, balanced nutrition is important for everyone, not just people with sickle cell disease. Children need healthy diets to grow well and to avoid illness.



The food pyramid was created to help people make healthy food choices.

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Healthy eating includes more grain products (breads, pasta, cereals, and rice), fruits, and vegetables, and less sweets and foods with fat (like many desserts!).



Learning and practicing good eating habits while still young can help avoid many diseases later in life, like heart disease, cancer, stroke, and diabetes.



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Your doctor has probably told you that you need to drink a lot of water and juice when you have sickle cell disease. Do you remember why?



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The two main reasons are to help prevent pain crises and because sickle cell disease affects your kidneys.



There are some kinds of drinks you should avoid. Do you remember which ones these are?



Drinks which have caffeine: found in a lot of soft drinks and in tea and coffee. Caffeine can cause your kidneys to make more urine, causing there to be less water in your blood. As you remember, less water in your blood makes it more likely that the blood cells in children with sickle cell disease will change into the sickle shape.

Soda: Too much soda can be bad for your teeth. Try to avoid soda!

(A little caffeine or soda is OK -- just be sure you also drink other fluids!)

## Related links

<http://www.emory.edu/PEDS/SICKLE/painepi.htm> - detailed information from the Comprehensive Sickle Cell Center on pain crises in sickle cell disease.

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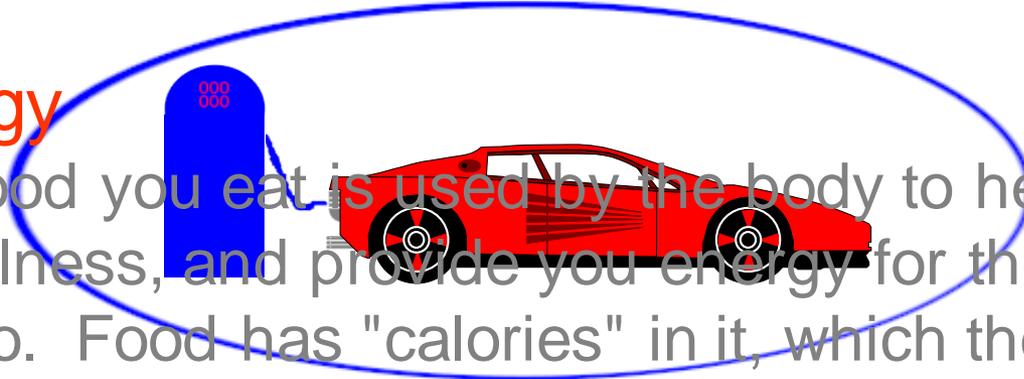


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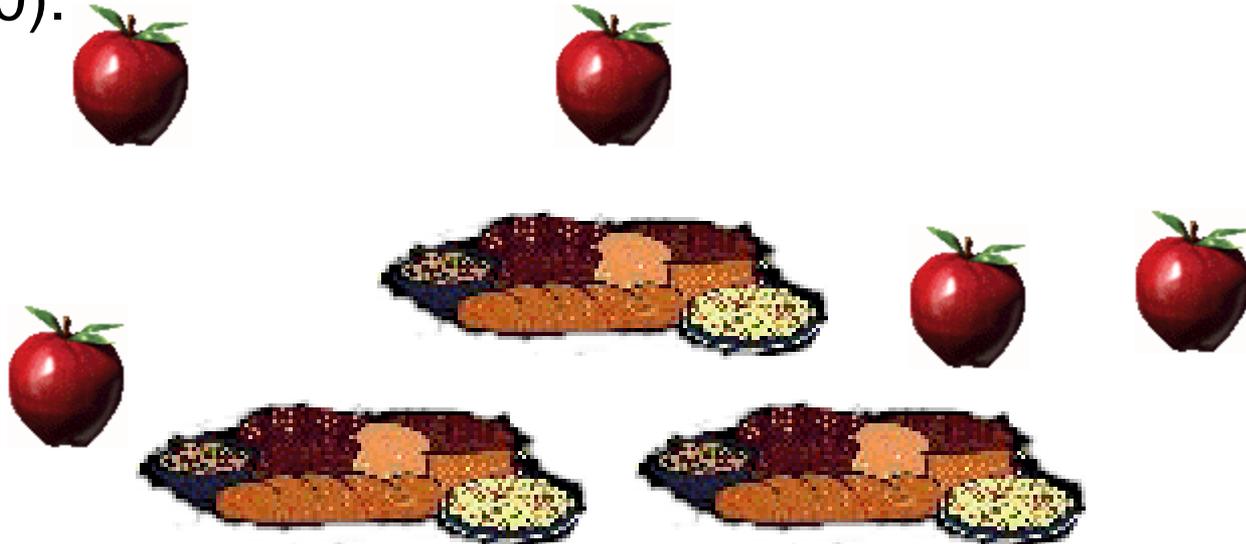
# Energy

The food you eat is used by the body to help you grow, fight illness, and provide you energy for the activities you do. Food has "calories" in it, which the body converts to the energy it needs to do all these things.

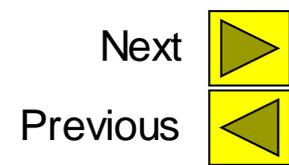
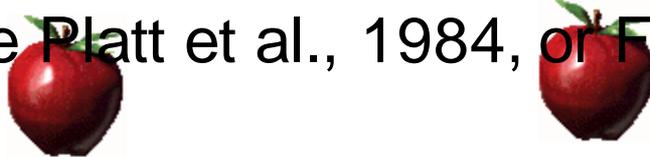


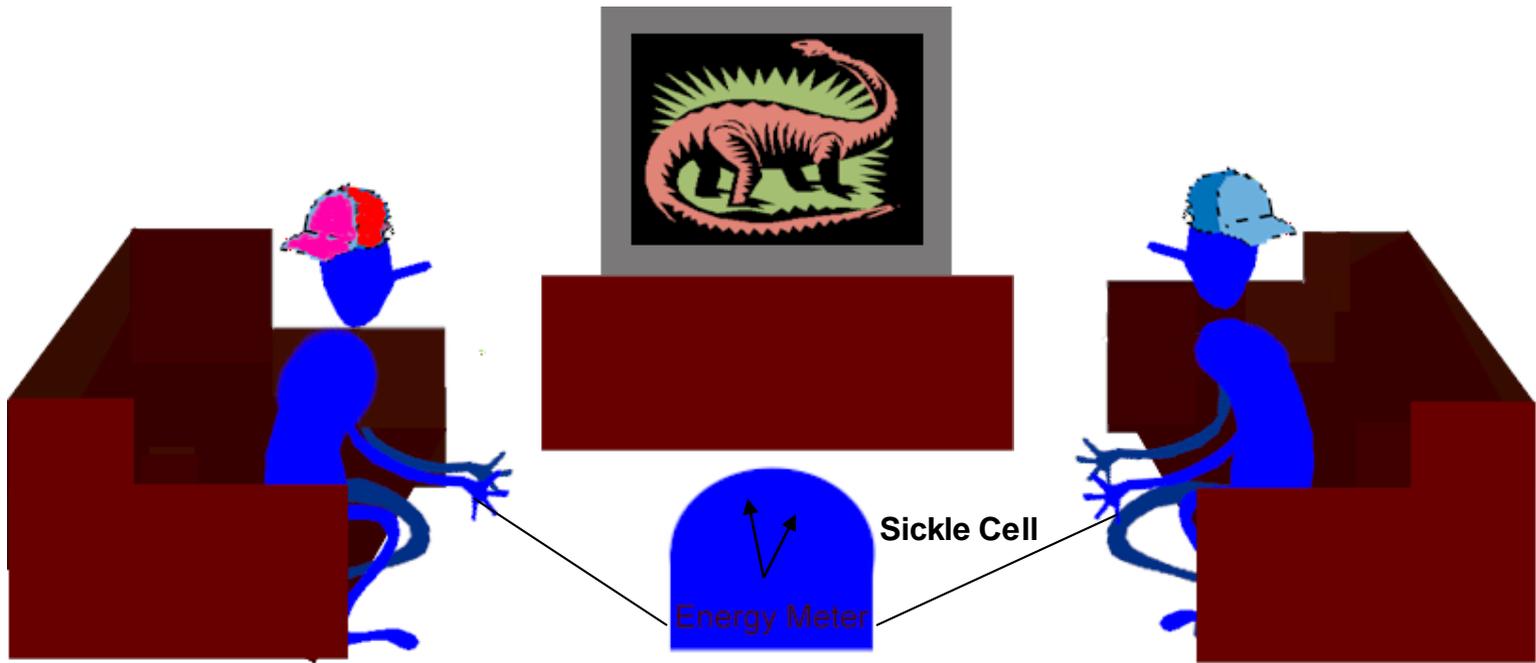
It's a little like putting gas in a car -- otherwise, the car can't go!

Children with sickle cell disease need more calories than other children (for example, see Barden et al, 2000).



Doctors have found out that children with sickle cell disease often have delays in growth and maturation (see Platt et al., 1984, or Finan et al, 1988).





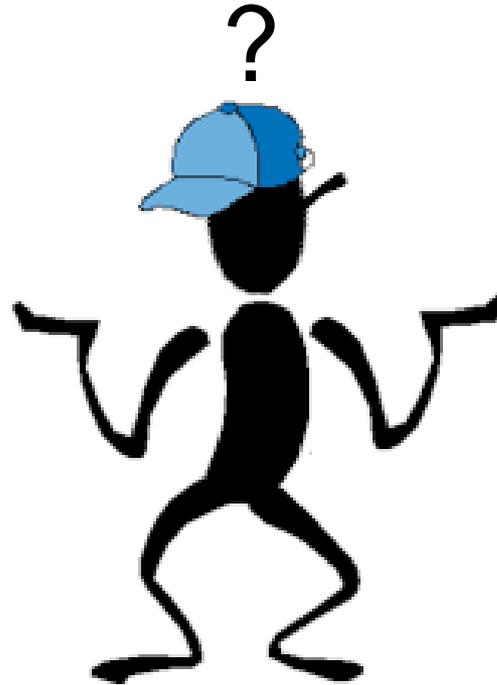
Children with sickle cell disease use more calories when doing things at rest (like watching TV) than children without sickle cell disease (Barden et al, 2000). Children with sickle cell disease may use about 20% more energy at rest than other children.

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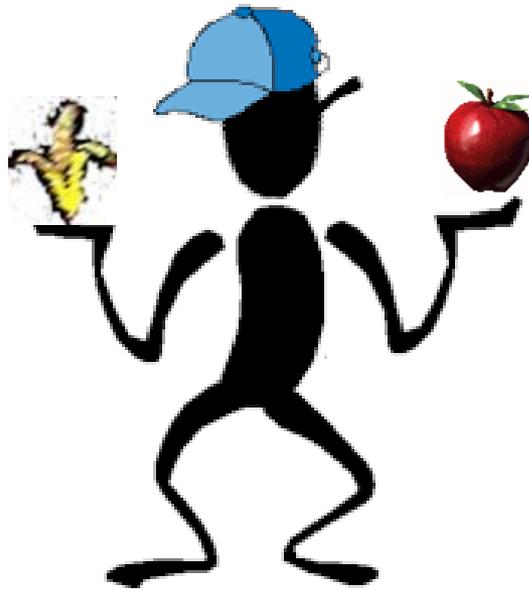
What kinds of food should you eat to get more calories?

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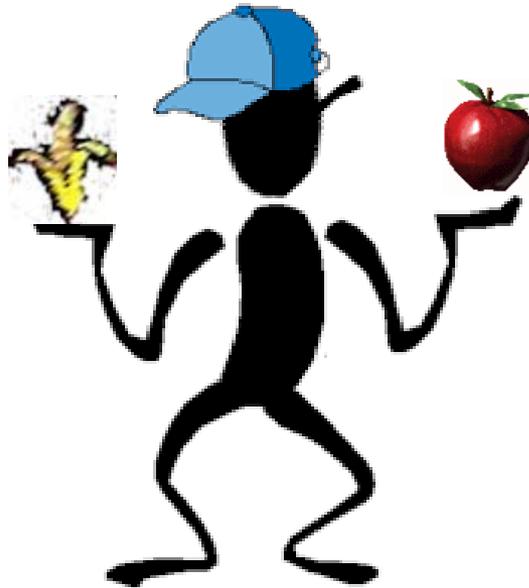


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What kinds of food should you eat to get more calories?



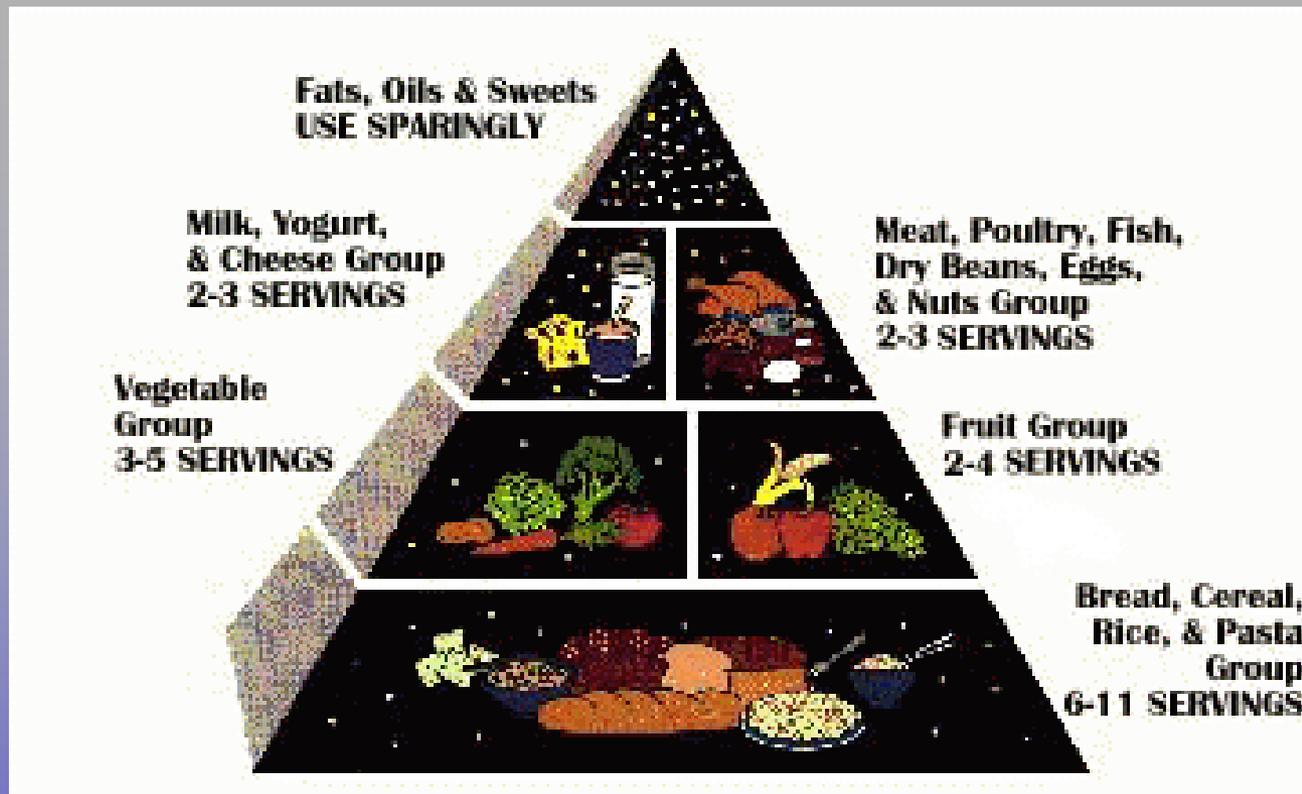
You should always rely on the food pyramid when making choices about what to eat. Try to snack on fruits, vegetables, and grains (bread, pasta, cereal -- but not too much sugar!).

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A survey of children with sickle cell disease and their parents showed that although 90% were familiar with the food pyramid, most did not eat enough servings from all of the food groups

(just like kids without sickle cell disease; Williams, 1997).

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Remember when we told you that it is important to eat right to help prevent sickness? It is just as important to get enough calories during and after illness!

When you're sick, your body needs energy to heal itself. One recent study showed that children with sickle cell disease often do not take in enough calories when they haven't been feeling well (Malinauskas, 2000).

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Although more calories are needed by children with sickle cell disease, it is important to avoid becoming overweight!



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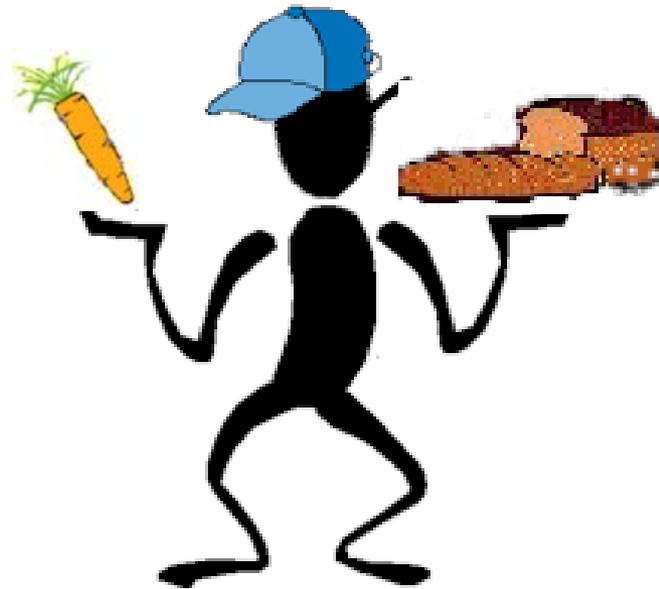
**Children with sickle cell disease often have to take medicines to decrease pain. One of the problems many of these medicines have is constipation. The good news is that there are foods you can eat that will help minimize problems with constipation. Do you know what these foods are?**

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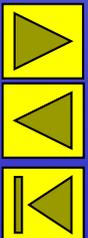


**Right! Foods like vegetables  
and grains contain fiber.**  
(Dried beans and peas, and oat and bran products  
are good sources, too!)

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Even though children with sickle cell disease need more calories, it is just as important for them to not get overweight. Obesity can lead to a higher chance for avascular necrosis of the hip, a big problem for children with the disease. Avascular necrosis can cause pain in the hip and legs and can lead to permanent walking problems. Eating fruits and other healthy snacks can help children get the calories they need without too much fat. Always remember the food pyramid, and include vegetables as part of healthy meals!



[Click here for more information on weight control in children](#)

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# Folate

**Children with sickle cell disease need extra folate to help make new blood cells.**

**Good sources of folate include:**

- Dry beans (like red beans, navy beans, and soybeans), lentils, chickpeas, cow peas, and peanuts**
- Many vegetables, especially leafy greens (spinach, cabbage, brussels sprouts, romaine, looseleaf lettuce), peas, okra, sweet corn, beets, and broccoli**
- Fruits such as blackberries, boysenberries, kiwifruit, oranges, plantains, strawberries, orange juice, and pineapple juice**

Since about a year ago, the USDA has asked companies to add folate to enriched flour, so many breads & cereals are now also high in folate!

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Doctors are continuing to try to answer questions about how different foods can help in sickle cell disease. Here are some of the areas they are looking into:

**Zinc-containing foods**

**Omega fatty acids\***

**African yams**

**Herbal products**



\*Found in oil from cold water fish, such as cod and salmon.



These nutritional research areas do not have enough results to recommend that you eat a specific amount of those items (at the time we prepared this material). Check with your doctor for research updates.

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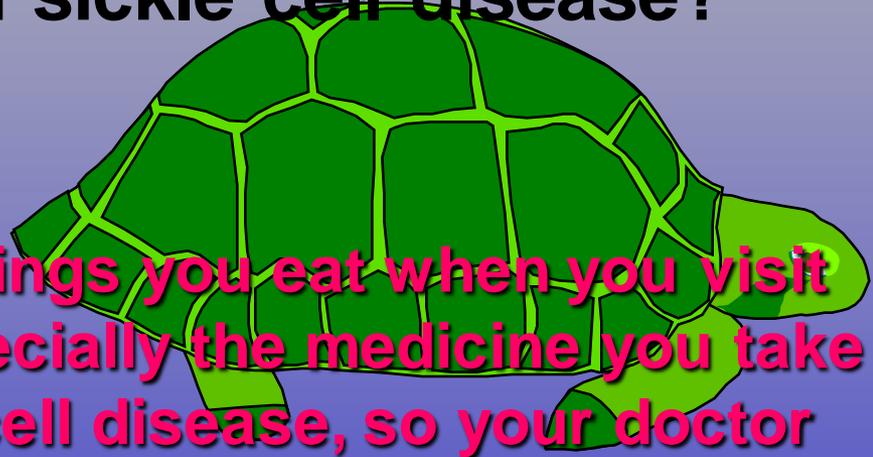


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**What is one of the most important things you should remember when you think about diet and sickle cell disease?**

**Remember which things you eat when you visit your doctor, and especially the medicine you take to help with sickle cell disease, so your doctor can help you make good choices about diet, nutrition, and treatment!**



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Here is a link to a site for healthy recipes, by the American Heart Association:



<http://www.deliciousdecisions.org/index.html>

You can send us your favorite recipe that include some of the tips that you just learned -> to Webmaster [aplatt@emory.edu](mailto:aplatt@emory.edu)

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## Other references

### Overall nutrition in sickle cell disease

Williams R, EO George, and W. Wang. Nutrition assessment in children with sickle cell disease. *Journal of the Association for Academic Minority Physicians* 8(3): 44-48, 1997

Platt OS, W Rosenstock, and MA Espeland. Influence of sickle hemoglobinopathies on growth and development. *New England Journal of Medicine* 311: 7-12, 1984

Finan AC, MA Elmer, SR Sasanow, S McKinney, MO Russell, and FM Gill. Nutritional factors and growth in children with sickle cell disease. *American Journal of Diseases of Childhood* 142: 237-240, 1988

Malinauskas BM, SS Gropper, DA Kawchak, BS Zemel, K Ohene-Frempong, and VA Stallings. Impact of acute illness on nutritional status of infants and young children with sickle cell disease. *Journal of the American Dietetic Association* 100(3): 330-334, 2000

### Resting energy in children with sickle cell disease

Barden EM, BS Zemel, DA Kawchak, MI Goran, K Ohene-Frempong, and VA Stallings. total and resting energy expenditure in children with sickle cell disease. *Journal of Pediatrics* 136(1): 73-79, 2000

### Dietary supplements (zinc, folate, antioxidants) in the diet of people with sickle cell disease

Ohnishi ST, T Ohnishi, and GB Ogunmola. Sickle cell anemia: a potential nutritional approach for a molecular disease. *Nutrition* 16(5): 330-338, 2000

Prasad AS, FW Beck, J Kaplan, PH Chandrasekar, J Ortega, JT Fitzgerald, and P Swerdlow. Effect of zinc supplementation on incidence of infections and hospital admissions in sickle cell disease (SCD). *American Journal of Hematology* 61(3): 194-202, 1999

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Pain crises: Your blood is mostly made up of water, some chemicals (salts), and blood cells. When there is less water, the blood cells in children with sickle cell disease are more likely to change into the sickle shape (go to <http://www.emory.edu/PEDS/SICKLE/rbcsickl.html> to see a normally shaped cell change into a sickle shaped cell).

This leads to a lot of the problems of sickle cell disease, including pain crises. Drinking a lot of water can help prevent this from happening.

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**Kidneys:** your kidneys are two organs in your body which help clean your blood of different chemicals. These chemicals go into your urine, which is made by the kidneys. Children with sickle cell disease have kidneys which make a little more urine than children who don't have the disease. This means that children with sickle cell disease need to drink more, to replace the water they lose when they make more urine.

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Children need enough food for proper growth. To promote growth and development and prevent overweight, teach children to eat grain products; vegetables and fruits; lowfat milk products or other calcium-rich foods; beans, lean meat, poultry, fish or other protein-rich foods; and to participate in vigorous activity. Limiting television time and encouraging children to play actively in a safe environment are helpful steps. Although limiting fat intake may help to prevent excess weight gain in children, fat should not be restricted for children younger than 2 years of age. Helping overweight children to achieve a healthy weight along with normal growth requires more caution. Modest reductions in dietary fat, such as the use of lowfat milk rather than whole milk, are not hazardous. However, major efforts to change a child's diet should be accompanied by monitoring of growth by a health professional at regular intervals.

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