SICKLE CELL TRAIT FREQUENTLY ASKED QUESTIONS

This resource can be used by health care providers when talking with parents about their child's sickle cell trait status.

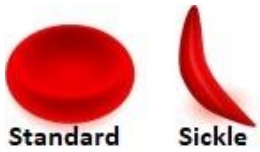
WHAT IS SICKLE CELL TRAIT?

Sickle cell trait (SCT) is not a disease, but an inherited blood condition. Which occurs when a person inherits a sickle hemoglobin gene from one parent and a standard (fully working) hemoglobin gene from the other parent. Therefore, a person with one sickle hemoglobin gene is said to 'carry' SCT.

Hemoglobin is a protein in red blood cells that carries oxygen throughout the body.

WHAT IS THE DIFFERENCE BETWEEN SCT AND SICKLE CELL DISEASE (SCD)?

SCT is the carrier state of SCD. SCD results from the inheritance of two sickle hemoglobin genes, one from each parent, which causes normally round red blood cells to become curved or "sickle" shape. When the sickled red blood cells travel through small blood vessels, they are more likely to become stuck and clog the blood flow to organs in the body. Since individuals with SCT have only one sickle hemoglobin gene, they still make enough standard hemoglobin to prevent the cells from sickling. Without sickling, red blood cells are able to transport oxygen to tissues and organs in the body without becoming stuck in the small blood vessels. SCT is NOT a milder form of SCD and individuals are at no higher risk for symptoms of SCD than anyone else.



WHO IS AFFECTED BY SCT?

SCT can occur in any ethnic group, but it is more common in certain populations such as African, Mediterranean, Middle Eastern and Asian groups. Worldwide, an estimated 300 million people carry SCT, with a prevalence ranging from 2% to 30% in more than 40 countries[1].The carrier frequency is estimated to be approximately 1/100 overall in the Alberta population.

WHAT HEALTH COMPLICATIONS ARE ASSOCIATED WITH SCT?

Most people with SCT will rarely have any associated health problems as a result of being a carrier and will not develop SCD. However, people with SCT are at increased chance of experiencing blocked blood vessels should they become significantly dehydrated, particularly during times of extremely strenuous activity. In rare cases, people who carry SCT may have some health issues such as blood in the urine, presence of excess proteins in the urine, or chronic kidney disease.

WHY IS IT IMPORTANT TO KNOW THAT MY CHILD HAS SCT?

Your child and their future partner may want to know this information before they plan to have children of their own. Should your child's partner also have SCT, then their children (your grandchildren) would be at an increased risk of having SCD (see Figure 1).

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WHAT DOES HAVING A CHILD WITH SCT MEAN FOR ME, MY PARTNER AND FOR FUTURE PREGNANCIES?

If both members of a couple carry SCT, they can have a child who has SCD. Each child born to a couple where both parents carry SCT has a:

- 1 in 2 (50%) chance of carrying SCT.
- 1 in 4 (25%) chance of having SCD.
- 1 in 4 (25%) chance that they will neither have SCT or SCD

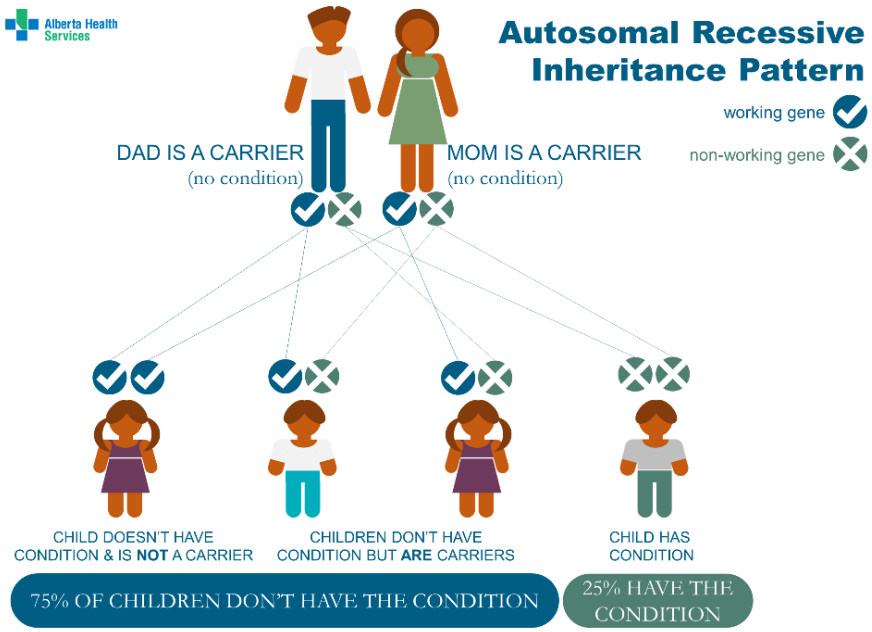

Figure 1: Autosomal Recessive Inheritance Pattern of SCT

If the parents of an infant with SCT are planning more pregnancies, carrier testing is recommended. Genetic counselling is also recommended if both parents are found to be carriers in order to review the different options available to the parents during pregnancy.

SHOULD MY OTHER CHILDREN BE TESTED?

If your other children were born outside of Alberta, or within Alberta but before April 1, 2019 they may not have been screened for SCD. Therefore, we suggest you talk with your family doctor about additional screening for SCD.

References

1. Naik, R. P., Smith-Whitley, K., Hassell, K. L., Umeh, N. I., de Montalembert, M., Sahota, P., et al. Clinical outcomes associated with sickle cell trait: a systematic review. Annals of Internal Medicine [Internet]. 2018 November [cited 2019 March 19]; 169 (9), 619-627. Available from: https://annals.org/aim/article-abstract/2709819/clinical-outcomes-associated-sickle-cell-trait-systematic-review