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Haematology Department

**Sickle Cell Disease – Chronic Complications**

**Transcranial Doppler Scan**

Information for parents and carers

**Introduction**

This factsheet is designed to explain about the long term (chronic) complications of sickle cell disease. The information does not cover everything. If you are ever worried about your child then please contact your Sickle Cell Team or take your child to Accident and Emergency Department.

**What is a transcranial Doppler scan?**

A transcranial doppler scan (TCD) is an ultra sound that detects the rate of blood flow in blood vessels (arteries) in the brain. By placing a probe over blood arteries in the head and neck the speed of blood can be measured in arteries supplying the brain with blood.

**Why do children have a transcranial doppler?**

Children with sickle cell disease can develop strokes. Strokes occur because of a problem with the blood circulation to the brain. Narrowing of arteries can restrict the blood supply to that part of the brain and cause damage. If the blood supply is restricted then it may increase the risk of a stroke as the parts of the brain affected do not get the oxygen to function properly.

The effects of a stroke range from life-threatening to severe intellectual or physical impairment to very subtle learning difficulties. This is why we want to try to prevent it from happening.

We know from research (Adams et al, 1992) that doing a transcranial doppler can identify those children who have had narrowing of blood vessels and are at risk of having a stroke. Early treatment can be offered to them to try to prevent complications.

**When and where will my child get a transcranial doppler scan?**

Your child will have their scan when they are two years old. The scan will take place in the Ultrasound Department before you attend one of your child’s routine clinic appointments.

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**What happens if the results show my child has normal blood flow?**

The transcranial doppler scan will be repeated in one years’ time.

It is important to know that this is only a screening test and a normal blood flow does not guarantee that your child could not develop a stroke in the future.

**What happens if the results show that my child has abnormal blood flow?**

If an abnormal blood flow is detected the transcranial doppler will be repeated within a few weeks. We may recommend further tests such as a head scan (MRI / MRA). These scans will check the brain and blood vessels in more detail.

If the results are still abnormal we will talk to you about the treatment options.

Occasionally the scan may not obtain any results through technical difficulties or the results will be inconclusive. If this happens then your child will be called again for another scan within a few months or sent for an MRI scan.

**What are the treatment options if my child has an abnormal scan?**

Once we receive all the results from the scans we will discuss the treatment options with you.

The research that has been done into stroke in children with sickle cell disease recommends that those children at risk have regular blood transfusions to help prevent strokes (Lee et al, 2006). This would mean that your child would receive a blood transfusion every month throughout childhood. Regular blood transfusions would decrease the amount of sickle cells in the body.

**Are there any alternatives to blood transfusions?**

No. Blood transfusions are seen as the best treatment option for those children who have had a stroke or are at risk of having a stroke.

The decision to start your child on regular blood transfusions will be based on all the test results and made after a full discussion with you and your child about the risks and benefits to them. For further information about blood transfusion see the blood transfusion information sheet.

**What should I remember after the test?**

Transcranial doppler scans only tell us if your child is at a higher risk of having a stroke at some point in the future. If your child ever displays symptoms of having a stroke, no matter how short lived you need to bring them to the hospital immediately. For further information about signs and symptoms of a stroke see the Stroke information leaflet.

**Further information**

If you need any further information please contact the Sickle Cell Team on 0151 252 5070.

**References**

Adams R, McKie V, Nichols F, et al. 1992. The use of transcranial ultrasonography to predict stroke in sickle cell disease. New England Journal of Medicine. Vol 326.

Lee, M. Piomelli, S., Granger, S. Miller, T. Harkness, S., Brambilla, D. and Adams, R. for the STOP Study Investigators. 2006. Stroke Prevention Trial in Sickle Cell Anemia (STOP):

extended follow-up and final results. BLOOD, Vol 108 (3).

**Useful websites**

[www.alderhey.co.uk](http://www.alderhey.co.uk)

[www.sicklecellsociety.co.uk](http://www.sicklecellsociety.co.uk)

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This leaflet only gives general information. You must always discuss the individual treatment of your child with the appropriate member of staff. Do not rely on this leaflet alone for information about your child’s treatment.

This information can be made available in other languages and formats if requested.

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