



SPAHA

SCOTTISH PAEDIATRIC AND ADULT HAEMOGLOBINOPATHIES NETWORK

Paediatric guidance

Transcranial Doppler (TCD) screening for Sickle Cell Disease (SCD)

NOTE

This guidance is not intended to be interpreted or used as a standard of care. Standards of care are determined based on the full range of clinical information available for an individual case and may change as scientific knowledge, technology, and clinical practice evolve. Following the recommendations in this guidance does not guarantee a successful outcome in every situation, nor does it encompass all appropriate methods of care or exclude other acceptable approaches that may achieve the same results. Clinical judgement remains the responsibility of the healthcare professional(s) involved in the patient's care. Clinicians must also be mindful of the requirements of patient autonomy and patient-centred care, which may involve a patient opting (after discussion of the available treatment options) for a treatment which is not the treatment recommended in the guidance. Where treatment involves deviation from national guidance, or local guidance derived from them, this should be fully documented in the patient's records at the time the decision is made.

This document has been prepared by NHS Public Services Delivery Scotland (PSD Scotland) on behalf of the Scottish Paediatric & Adult Haemoglobinopathies network (SPAHA). Accountable to Scottish Government, PSD Scotland works at the heart of the health service providing national strategic services to the rest of NHS Scotland and other public sector organisations to help them deliver their services more efficiently and effectively. SPAHA is a collaboration of stakeholders involved in the care of patients with a haemoglobinopathy, who are supported by an NSS Programme Team to drive improvement across the care pathway.

©PSD Scotland 2026. You can copy or reproduce the information in this resource for use within NHS Scotland and for non-commercial educational purposes under creative commons CC BY-NC 4.0 Deed | Attribution-Non Commercial 4.0 International | Creative Commons. Use of this document for commercial purposes is permitted only with the written permission of PSD Scotland.

Scottish Paediatric & Adult Haemoglobinopathy Network

Transcranial Doppler (TCD) screening for Sickle Cell Disease (SCD)

Contents

Background.....	3
Patient/parent information	3
TCD referral procedure	3
Actions to be taken based on results of TCD	4
References.....	5
Appendix.....	6

Scottish Paediatric & Adult Haemoglobinopathy Network

Transcranial Doppler (TCD) screening for Sickle Cell Disease (SCD)

Background

HbSS and HbS β^0 patients

All children and young adults with Hb SS and HbS β^0 thalassaemia subtypes of sickle cell disease, should be offered annual TCD scans from age 2 years until at least age 16 years. This is based on the findings of a randomised controlled trial on the benefits of transfusion in children with raised cerebral blood-flow velocities in the reduction of stroke. The NHS Sickle Cell and Thalassaemia Screening Programme has published Standards and Guidelines for Transcranial Doppler scanning in Children with SCD.^{1,2}

HbSC patients

There is no national recommendation for the screening of children with HbSC sickle cell disease. There is still a risk of cerebrovascular disease, but this is lower than for children with HbSS or HbS β^0 and the yearly screening and normal values for the other sickle cell groups are thought to be inappropriate as this group of children are not anaemic to the same extent. In Scotland we have developed an approach for this group based on guidance obtained from Kings College Hospital who provided us with their protocol and normal values, based on their assessment of many children with this genotype³ and which is in keeping with other publications.⁴

Patient/parent information

Prior to the TCD, parents and carers should be given appropriate verbal and written information by the referring team to enable an informed decision to be made about the necessity of the TCD scan and for families to understand and accept the need for of chronic transfusion and its consequences if an abnormality is detected. The association between high blood velocity in the cerebral arteries and the risk of a stroke should be made clear and hence the purpose of the test. SPAH patient information leaflets are available, for those living within NHS GG&C and those who live outwith NHS GG&C click [here](#).

The information leaflet also explains the TCD process and the limitations of the procedure will be sent to parents and carers with the first appointment. There will be a brief discussion about the results with the RHC Haematologist on the day. If an abnormality is found, this will be explained along with the follow up process for further TCD and a letter with results will be sent back to the referring clinician.

TCD referral procedure

In Scotland TCD studies are carried out centrally at RCH Glasgow. The referral form is available on the SPAH website [here](#) and should be sent to the **RHC Non-malignant team on ggc.rhctcdreferrals@ggc.scot.nhs.uk**

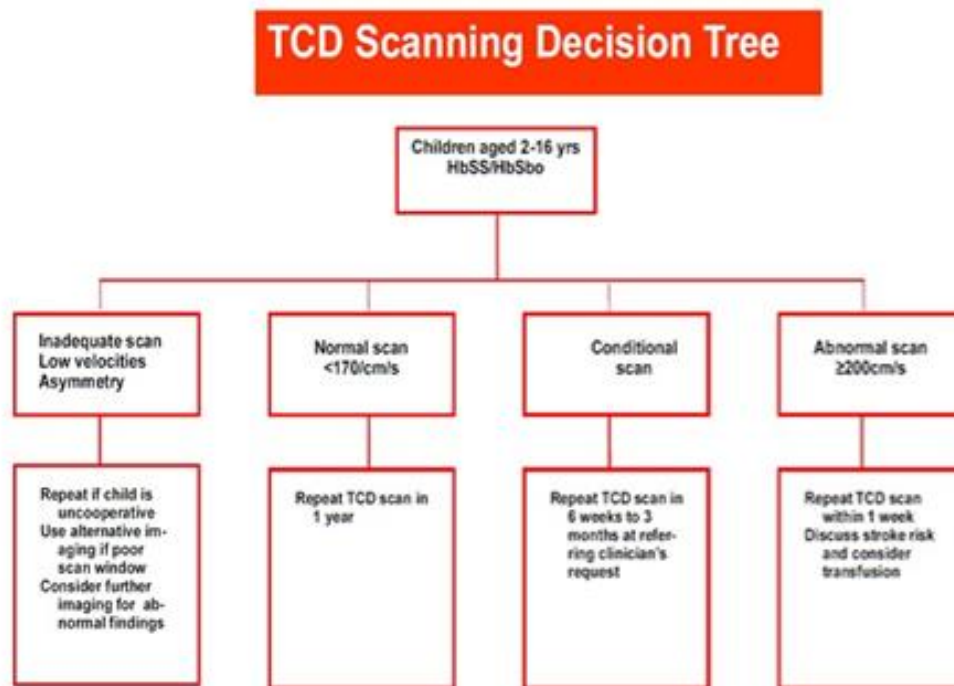
Results will be returned to the referring clinician with a covering letter. In the event that the patient DNAs they will be automatically reappointed and the referring clinician will be informed. Families may be eligible to reclaim travel costs from the local health board and should be given the appropriate claim form by their local team and advised to keep their receipts.

Scottish Paediatric & Adult Haemoglobinopathy Network

Transcranial Doppler (TCD) screening for Sickle Cell Disease (SCD)

HbSS and HbS β^0 TCD protocol

As per national protocol TCD screening should be offered at least annually from the age of 2 years to all children with HbSS and HbS β^0 sickle cell disease. Timings of repeat scanning depend on the TCD results as below.



Velocities are the time-averaged maximum mean (TAMMV) measured by non-imaging or imaging TCD. Velocity thresholds apply to the MCA, distal ICA, bifurcation and ACA.

HbSC TCD procedure

Children with HbSC should receive a transcranial Doppler scan at

- 2yrs of age,
- 5 yrs of age and
- 10 yrs of age

If TAPV readings are <132 cm/s then no additional scans are required

If TAPV readings of > 132 cm/s are obtained then closer review and further imaging should be considered in discussion with the clinical MDT.

Actions to be taken based on results of TCD

Interpretation of TCD velocities and recommendations for further investigation and clinical management can be found in the Transcranial Doppler Scanning for Children with Sickle Cell Disease Standards and Guidance, Second Edition September 2016.

Scottish Paediatric & Adult Haemoglobinopathy Network

Transcranial Doppler (TCD) screening for Sickle Cell Disease (SCD)

References

1. Standards and Guidance for Clinical Care, 2nd Edition 2019
2. [Transcranial Doppler Scanning for Children with Sickle Cell Disease Standards and Guidance Second Edition September 2016 - UK Forum \(haemoglobin.org.uk\)](#)
3. Communication form Dr Sue Height and Dr Colin Deane, Kings college Hospital NHS trust
4. Transcranial Doppler in haemoglobin SC disease. Viera C et al; Paediatric Blood and Cancer E26342, Volume 65 issue 4

All content is available under the [Open Government Licence v3.0](#) except for graphic assets and where otherwise stated.

Scottish Paediatric & Adult Haemoglobinopathy Network

Transcranial Doppler (TCD) screening for Sickle Cell Disease (SCD)

Appendix - Guidelines and Protocols subgroup membership

Name:		Job Title:	Organisation:
Katrina	Adams	Non-Malignant Haematology Nurse Specialist	NHS GG&C
Ruth	Allen	Consultant Paediatric Radiologist	NHS GG&C
Susan	Baird	Consultant Paediatric Haematologist	NHS Lothian
Nadia	Catherwood	Paediatric Haematology Nurse Specialist	NHS GG&C
Shahzya	Chaudhury	Consultant Paediatric Haematologist	NHS GG&C
Sarah	Clarke	Non-Malignant Paediatric Haematology Consultant	NHS GG&C
Emma	Cockburn	Consultant Paediatrician	NHS Tayside
Cheryl	Hill	Non-Malignant Haematology Nurse Specialist	NHS GG&C
Kirsten	Husselbee	Consultant Paediatrician	NHS Tayside
Jennifer	Milne	Paediatric Haematology Nurse	NHS Tayside
Lucy	Paterson	Clinical Nurse Specialist - Benign Haematology	NHS Lothian
Fernando	Pinto	Consultant Paediatric Haematologist	NHS GG&C
Rosina	Shujaat	Consultant Paediatric Haematologist	NHS Lothian
Gordon	Taylor	Consultant Paediatric Haematologist	NHS Grampian
Sasi	Yadavali	Specialty Doctor in Paediatric Haematology	NHS GG&C