

Scope

This guideline is aimed at all Health care professionals involved in the care of infants within the Neonatal Service.

Legal Liability (standard UHL statement)

Guidelines issued and approved by the Trust are considered to represent best practice. Staff may only exceptionally depart from any relevant Trust guidelines providing always that such a departure is confined to the specific needs of individual circumstances. In healthcare delivery such departure shall only be undertaken where, in the judgement of the responsible health professional, it is fully appropriate and justifiable – such decisions to be fully recorded in the patient's notes.

Key Points

- Neonatal alloimmune thrombocytopenia (NAIT) has a spectrum of disease ranging from subclinical moderate thrombocytopenia to catastrophic intracranial haemorrhage and death.
- Consider NAIT in any infant with unexplained bleeding or thrombocytopenia (platelet count $<100 \times 10^9/l$).
- If NAIT suspected, use compatible platelets (usually HPA1a and 5b negative)
- [Platelet transfusion thresholds are listed below](#)

Background

- Neonatal alloimmune thrombocytopenia (NAIT) is a disorder caused by fetomaternal platelet incompatibility analogous to that in Rhesus Haemolytic Disease, with maternal anti-platelet antibodies crossing the placenta and destroying fetal platelets.
- The majority of cases are caused by antibodies directed against Human Platelet Antigen-1a (HPA-1a) and HPA-5b, but many rarer reactions have been reported.
- Prospective studies have shown incidence to be 1:1,100 live births, but the condition is under-reported.
- Mortality is around 10% of presenting cases, with neurological sequelae, including intracranial haemorrhage and subsequent neurodevelopmental delay in up to 25%.

Guidelines/Recommendations

- Consider NAIT in all cases of unexplained neonatal thrombocytopenia (Platelets $<100 \times 10^9/l$).
- If NAIT suspected, neonatal team should liaise with haematologists.
- Send maternal and paternal blood samples (via haematology service) to Bristol blood group reference lab for platelet antigen genotype and detection of maternal alloantibody to paternal platelets. (See Table 1)

Table 1

	SAMPLES REQUIRED		TESTS
	EDTA	Clotted	
Maternal	20 mls	10 mls	Antibody screen vs Donor platelets Platelet HPA genotype Cross match maternal serum with paternal platelets
Paternal	20 mls	-	Cross match maternal serum with paternal platelets Platelet HPA genotype
Baby	1 ml	-	Platelet HPA genotype

- Monitor neonatal platelet count daily as it can continue to fall for the first 48 hours after birth.
- In suspected NAIT if the platelet count falls below $50 \times 10^9/l$ or if symptoms occur, perform a cranial ultrasound scan to exclude intracranial haemorrhage

Platelet count thresholds for neonatal platelet transfusion*:

- $<25 \times 10^9/l$: transfuse compatible platelets (usually HPA1a and 5b negative). At this level, transfusion is indicated in all infants with or without suspected NAIT even if there is no active bleeding and no family history of intracranial haemorrhage
- $<50 \times 10^9/l$: Transfusion for neonates with bleeding, current coagulopathy, before surgery, or infants with NAIT if previously affected sibling with intracranial haemorrhage
- $<100 \times 10^9/l$: Transfuse in Neonates with major bleeding or requiring major surgery (e.g. neurosurgery)

*(from BCSH guideline 2016)

- If NAIT is suspected and platelet transfusion is required, DO NOT wait for results of confirmatory tests before transfusing platelets.
- HPA1a and 5b negative donor platelets should be used. Maternal platelets may also be used.
- If platelets are unavailable, give IV immunoglobulin (1g/kg/day for 1-3 days). The effect on platelet count may be delayed for 24-48 hours.
- If persistent thrombocytopenia, give IV immunoglobulin (1g/kg/day for 1-3 days). The effect on platelet count may be delayed for 24-48 hours. IV immunoglobulin is not ideal as sole treatment for a neonate with bleeding or severe thrombocytopenia. If used, patient information should be given and verbal consent obtained.
- The mother should receive counselling about the risks for, and management of, subsequent pregnancies (75-90% will be affected)
- Should also be informed of risks associated with blood transfusion (Post-transfusion purpura). However now that all blood in the UK is leukodepleted, the risk is minimal.
- Give the National Blood Service leaflet 'Platelet groups and Antibodies in Pregnancy'
- Document on front of all sets of maternal patient notes:

Warning: Patient has potential risk of fatal complications after blood transfusion

And, in addition on the front of maternity notes:

Warning: Fetus at risk of alloimmune thrombocytopenia.

- Family members especially sisters of the mother should be screened – this should be arranged with haematology / Bristol blood group reference laboratory.

Subsequent pregnancies

- Early booking appointment. Patients should be fast tracked or self-referred if possible.
- Discuss risks to fetus (patient should have received pre-pregnancy counselling)
- Determine whether the father is homozygous or heterozygous for the relevant antigen. If heterozygous, fetal platelet genotyping should be carried.
- Outline antenatal care plan.
- USS to determine gestation
- Steroids and IV Immunoglobulin should be given from 12 weeks if there is a history of fetal haemorrhage in the previous pregnancy, otherwise from 20 weeks.
- Refer to specialist centre for fetal blood sampling at 20-24 weeks if there was a haemorrhage in the previous fetus, otherwise refer at 28 weeks. Further management by intrauterine transfusions if necessary should be done at the specialist centre.
- The timing of further fetal blood sampling and transfusion procedures depends on the platelet count at the initial fetal blood sampling.
- IV immunoglobulin may need to be doubled or discontinued depending on whether there has been partial or no response respectively.
- Delivery should be by elective caesarean section with compatible platelets available (alternatively intrauterine platelet transfusion followed by vaginal delivery to be done at specialist centre)
- Check cord platelet count and if $<25 \times 10^9/l$ or if symptomatic, treat as above.

Screening

- Previous or family history of NAIT
- Also consider screening for mothers of neonates with unexplained thrombocytopenia, hydrocephalus or unexplained late fetal loss particularly where there has been an intracranial haemorrhage.

References

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- Neonatal alloimmune thrombocytopenia, *Cécile Kaplan, Platelet immunology, GIP-INTS. doi: 10.3324/haematol.13160*

Audit standards

- If platelets $<25 \times 10^9/l$, documentation of platelet transfusion or reason for deferring (100%).
- HPA1a and 5b negative donor platelets should be used (100%).
- Document in front of the maternal notes about potential risks (100%)

Guideline development:

1999	Dr S Pavord & Dr C Hawork
2005	Updated by Dr S Pavord & D Elliott,
March 2011	Updated by Dr S Pavord, P Coser & M Copple
July 2013	Neonatal unit update: N Rafeullah, A Grover, S Pavord
July 2018	Neonatal Guidelines Meeting