Anti-D administration

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1. Purpose of guideline

This guideline establishes the expected process for the administration of Anti-D immunoglobulin or its equivalent during the antenatal and postnatal period including routine prophylactic Anti-D at 28 and 34 weeks and postnatal period, in order to minimise Rhesus iso-immunisation and haemolytic disease of the newborn (HDN) or fetus within Auckland District Health Board (Auckland DHB).

2. Background

The development of Anti-D antibodies usually occurs because of a fetomaternal haemorrhage (FMH) at birth in a rhesus D (RhD) negative mother carrying an RhD positive fetus.

3. Antenatal

It is the lead maternity carer's (LMC) responsibility to ensure that the woman's rhesus status is clearly documented on the booking form and a copy of the Blood Bank report of the woman's blood group and Rh factor is available via Concerto or 3M.

It is the LMC's responsibility to:

- Ensure that the woman with RhD negative blood type is aware of the possible requirements of Anti-D during the antenatal and postnatal period and the process involved for administration.
- Discuss and offer routine prophylactic Anti-D at 28 and 34 weeks gestation
- Give the woman a copy of the New Zealand Blood Service (NZBS) 'Your guide to blood transfusion - Anti-D Immunoglobulin' pamphlet (see Associated documents).
- Inform other health professionals of the woman's blood-group status when referring or transferring care to another LMC or maternity provider.

All RhD negative women (who have not actively formed their own Anti-D) should be offered Anti-D in the following clinical situations:

First trimester (before 12 weeks):

- Spontaneous miscarriage without the need for surgical intervention
- Surgical evacuation < 12weeks gestation (termination of pregnancy or incomplete miscarriages)
- Ectopic pregnancy
- Molar pregnancy (complete mole does not have fetal cells)
- Threatened abortion
- Chorionic villus sampling.

A 250 IU (50 microgram) dose of Anti-D Immunoglobulin should be administered. For multiple pregnancies, 625 IU should be administered.

Second and third trimester (12 weeks onwards):

- Miscarriages >12 weeks or intra uterine death
- Amniocentesis or other invasive fetal intervention
- Antepartum haemorrhage (placenta praevia, placental abruption, idiopathic process)
- Suspected concealed abruption
- Abdominal trauma or any other suspected intra-uterine bleeding or sensitising event
- External cephalic version of a breech presentation, whether successful or not a single dose of 625 IU (125 microgram) Anti-D immunoglobulin should be administered.

All women who experience a potential sensitising event after 20 weeks gestation should have the magnitude of the FMH assessed by a Kleihauer test and if necessary further Anti-D immunoglobulin administered.

Where the body weight exceeds 100 kg, an additional dose may be appropriate.
Where a dose of greater than 1200-1250 IU Anti-D immunoglobulin (two vials) is indicated by a Kleihauer result, a consultation with a transfusion medicine specialist is recommended.

Obstetric events requiring a further dose of Anti-D immunoglobulin

- Intermittent bleeding that continues after 12 weeks gestation: Anti-D immunoglobulin should be given at two weekly intervals.
- If a subsequent risk event for immunisation occurs a further dose of Anti-D immunoglobulin should be offered if previous dose given two weeks or more ago.

Where the previous dose was given less than two weeks previously, a further dose of Anti-D immunoglobulin should be offered if the pregnancy is more than 20 weeks gestation and the size of the fetomaternal bleed is likely to be greater than 12 mL blood (6 mL red cells) in total.

4. Routine antenatal prophylactic Anti-D immunoglobulin

- All RhD negative women (who have not actively formed their own Anti-D) **should be** offered a prophylactic dose Anti-D Immunoglobulin (625 IU) at approximately 28 weeks and 34 weeks gestation.
- Blood **should be** taken for red cell antibody screen and if appropriate, RhD antibody titre prior to administration of Anti-D Immunoglobulin in order to detect those who have already become immunised.
- If circumstances do not permit a delay after collecting the test sample, administer Anti-D Immunoglobulin and await test result.
- The blood test may be omitted at 34 weeks gestation if prophylactic Anti-D Immunoglobulin was given at 28 weeks gestation.
- Routine antenatal prophylactic Anti-D immunoglobulin does not replace the need for a Kleihauer test and the administration of Anti-D immunoglobulin for sensitising events. Conversely, routine antenatal prophylactic Anti-D immunoglobulin should not be withheld if Anti-D has previously been given for a sensitising event.

- Anti-D Immunoglobulin **should not be** given to any woman with existing Anti-D antibodies except where the existing Anti-D is due to the antenatal administration of Anti-D Immunoglobulin.
- If there is uncertainty whether the Anti-D detected in the woman's blood is passive or formed, her clinical notes should be checked to confirm whether Anti-D Immunoglobulin was administered in the last six weeks. If there is any doubt, Anti-D Immunoglobulin should be administered.
- There will be circumstances where the woman has not received the first routine antenatal prophylactic Anti-D at 28 weeks gestation. It should be administered as soon as possible (see Appendix 2: Antenatal Prophylactic Anti D pathway for women > 28 weeks gestation at first contact).
- Where a woman who is RhD negative is of a transient nature and may not return for a 2nd dose of Anti-D immunoglobulin at 34 weeks, the LMC can prescribe one dose of 1250 IU Anti D immunoglobulin. For this reason, stock doses of Anti-D immunoglobulin will be kept at the maternity outpatient's clinics, Greenlane Clinical Centre (GCC). LMC's may contact a senior medical officer obstetrician for advice.

See Appendix 1: Routine Antenatal Prophylactic Anti D pathway for arranging and administration of routine antenatal prophylactic Anti-D.

5. Intrauterine fetal death.

- In the case of an intra-uterine fetal death (IUFD) in an RhD negative woman, the IUFD itself is regarded as a sensitising event, therefore a Kleihauer should be taken at the time of diagnosis of IUFD, rather than at the time of delivery.
- Anti-D immunoglobulin, 625 IU should be administered within 72 hours of the diagnosis of IUFD.
- **If the Kleihauer result is > 6 mLs at the time of diagnosis of IUFD, consult a senior obstetric staff member and a transfusion medicine specialist from New Zealand Blood Service**
- An additional Kleihauer should be performed following birth of the placenta.
- Blood group identification and RhD typing should be performed on the cord or placental vessel blood where possible.
- If the baby is confirmed to be RhD positive and/or the post placental Kleihauer is > 6mLs , consult a senior obstetric staff member and a transfusion medicine specialist from New Zealand Blood Service as additional Anti-D immunoglobulin may be required.

6. Following the birth for women with RhD negative blood type

With parental consent, a cord blood sample (6 mL pink Vacutainer® tube) should be sent to the laboratory or Blood Bank to identify the Rh antigen status of the newborn.

A maternal blood sample (purple-topped EDTA tube) for a Kleihauer screening test should be performed within two hours of delivery of the placenta.

The Kleihauer test identifies women with a large FMH who may require additional Anti-D immunoglobulin.

Within 72 hours of birth

- The LMC is responsible for reviewing blood results for both mother and baby. Both the mother and baby's blood result must be reviewed together, to ensure that the correct dose of Anti-D immunoglobulin is prescribed and administered.
- If the baby's blood group is RhD negative, regardless of Kleihauer result, no action is required for the mother. (If Kleihauer is >6 mL, consider discussing baby with paediatrician).
- If baby is RhD **positive** and Kleihauer result is **negative or < = 6 mL**, administer 625 IU of Anti-D immunoglobulin.
- If baby is RhD **positive** and Kleihauer result is **> 6 mL**, consult senior obstetric staff member and a transfusion medicine specialist from New Zealand Blood Service.
- For multiple births where one or more babies are RhD **positive,** administer at least 625 IU of Anti-D immunoglobulin. Further Anti-D immunoglobulin may be required according to the Kleihauer result.
- For manual removal of placenta, administer at least 625 IU of Anti-D immunoglobulin. Further Anti-D immunoglobulin may be required according to the Kleihauer result. The Kleihauer should be done after the manual removal procedure.

If a woman with an RhD positive baby is not given Anti-D immunoglobulin within 72 hours of birth, the dose must still be given as soon as possible, up to 10 days after birth.

7. Practice points for administration of Anti-D immunoglobulin

	Practice point
1.	Before Anti-D immunoglobulin can be administered, the woman must: • Receive a full explanation • Be given written information 'Your guide to blood transfusion - Anti-D Immunoglobulin' available in all Auckland DHB maternity areas and on the New Zealand Blood Service website. • Sign an Agreement to Treatment form (CR0111).
2.	• Auckland DHB staff must follow the 'Blood Components and Blood Products Administration' clinical guideline (see Associated documents). • The Blood Products Administration Checklist (CR9043) must be used whenever Anti-D immunoglobulin is administered. • Check there is a written prescription for the Anti-D immunoglobulin and that the blood product supplied matches the prescription.
3.	At least 625 IU of Anti-D immunoglobulin should be given to every non-sensitised RhD negative woman who gives birth to an RhD positive infant, infant with indeterminate blood group , or stillbirth where the blood group is unable to be ascertained, even when the Kleihauer test is negative.

	Practice point
4.	Anti-D immunoglobulin should be given as soon as possible after the birth and within 72 hours, regardless of prior anti- D immunoglobulin for routine prophylaxis or for a sensitising event.
5.	Where delays occur with fetal blood analysis .e.g. a clotted specimen or no specimen sent, perform the Kleihauer screening test within two hours if not already done, and retest the baby by micro collect at the earliest opportunity. Aim to administer the correct dose of Anti-D within 72 hours.
6.	Intramuscular Anti-D immunoglobulin is best given into the deltoid muscle (upper arm) to avoid slow absorption through subcutaneous tissues that can occur when using the gluteal muscle, especially in women with a high Body Mass Index.
7.	Women with severe thrombocytopenia and women who will require multiple ampoules of Anti-D immunoglobulin for a very large fetomaternal bleed should receive the intravenous form of Anti-D immunoglobulin.
8.	Transfer to Birthcare Auckland need not be delayed by this process; ensure both verbal and written handover includes requirement for administration of Anti-D immunoglobulin. The LMC is responsible to chase results and give Anti-D where needed.
9.	Where a dose of greater than 1200-1250 IU Anti-D immunoglobulin (two vials) is indicated by a Kleihauer result, a consultation with a transfusion medicine specialist – New Zealand Blood Service is required.
10.	Women who are reported as having 'Indeterminate blood group' should be treated as RhD negative and babies who are reported as having 'Indeterminate blood group' should be treated as RhD positive to ensure that Anti-D immunoglobulin is administered to reduce any risk of antibodies forming.

8. Women who decline Anti-D immunoglobulin

A woman may choose to decline Anti-D immunoglobulin; this decision must be respected by the health professional. However, the health professional must clearly document the woman's reasons for declining and the information the health professional has given to the woman regarding the need for and the possible consequences of not receiving Anti-D immunoglobulin.

9. Intra-operative cell salvage (ICS) and Kleihauer testing

When the ICS is used during a caesarean section on RhD negative women and that blood is re-infused, the Kleihauer *must be taken after the reinfusion has been completed*. If the Kleihauer has been taken prior to re-infusing the blood, a repeat Kleihauer *must be taken after the reinfusion has been completed.*

10. Management of missed, late or inadequate dose of Anti-D immunoglobulin

Late Anti-D immunoglobulin is classified as being given more than 72 hours after a sensitising event. Inadequate dose is classified as where further doses of Anti-D immunoglobulin were

required and not administered. These events must be reported using the Auckland DHB Datix system.

11. Cell-free Deoxyribonucleic acid (DNA) assessment of fetal RhD genotype

Women who have been shown to be carrying an RhD negative fetus do not require Anti-D prophylaxis either as routine or for potentially sensitising events.

12. Supporting evidence

- Hutt Valley DHB. (2016). *Anti-D Administration Policy*, Lower Hutt: Hutt Valley DHB.
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- Canterbury District health Board. (2016). *Use of Rh(D) immunoglobulin in unsensitised rhesus negative women for the prevention of Haemolytic disease of the new born*. Retrieved from: https://edu.cdhb.health.nz/Hospitals-Services/Health-Professionals/maternity-care-guidelines/Documents/GLM0047-Use-of-Anti-D-Immunoglobulin.pdf.

13. Associated documents

- Blood Components and Blood Products Administration
- Intrapartum Care - Physiological Labour and Birth

Forms

- CR0111: Agreement to Treatment
- CR9043: Blood Products Administration Checklist
- CR7029: Blood Bank Issue Sheet

Other

- NZ Blood Clinical Information available at: https://www.nzblood.co.nz/clinical-information/transfusion-medicine/information-for-health-professionals/clinical-guidelines-and-policies/

Patient information

- National Day Stay Prescription Sheet
- Your guide to blood transfusion - Anti-D Immunoglobulin

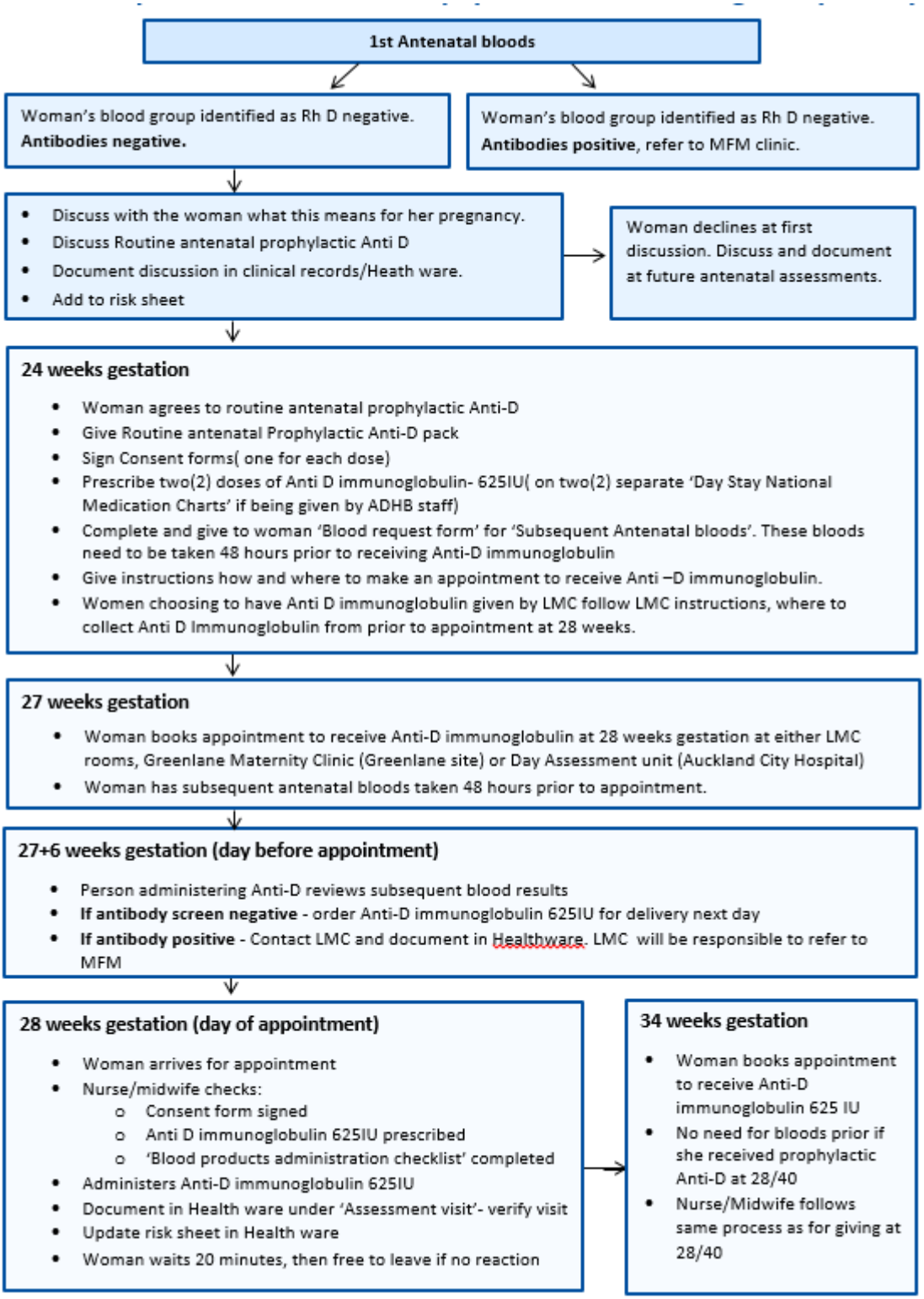
14. Disclaimer

No guideline can cover all variations required for specific circumstances. It is the responsibility of the health care practitioners using this Auckland DHB guideline to adapt it for safe use within their own institution, recognise the need for specialist help, and call for it without delay, when an individual patient falls outside of the boundaries of this guideline.

15. Corrections and amendments

The next scheduled review of this document is as per the document classification table (page 1). However, if the reader notices any errors or believes that the document should be reviewed ***before*** the scheduled date, they should contact the owner or Document Control without delay.

Appendix 1: Routine Antenatal prophylactic Anti-D pathway 1.



Appendix 2: Antenatal prophylactic Anti-D immunoglobulin pathway 2 for RhD negative woman

When the first routine antenatal prophylactic Anti D is not given at 28 weeks gestation, it should be administered as soon after that as possible #

- Late booking with LMC
- Transferred from other DHB where not offered
- Infrequent antenatal care
- Declined at 28 week but requests at a later date

Woman declines routine antenatal prophylactic Anti-D on first discussion.

- Discuss at subsequent antenatal assessment and document discussion

Woman's blood group identified as Rh D negative, with negative antibodies.

- Discuss with the woman what this means for her pregnancy. Give written information.
- Discuss routine antenatal prophylactic Anti-D
- Document conversation in clinical records/Healthware.
- Update risk sheet

< 28 weeks gestation

- If gestation ≥ 27 weeks gestation and woman not able/unlikely to return for routine antenatal prophylactic Anti-D at 28 and 34 weeks gestation follow pathway for ≥ 28 weeks gestation. LMC/prescriber to consider giving one dose of 1250IU Anti-D immunoglobulin #
- Otherwise follow **pathway 1.**

≥ 28 weeks gestation

- Offer Woman routine antenatal prophylactic Anti-D
- Woman agrees to prophylactic Anti-D
- Sign consent form
- Prescribe Anti-D immunoglobulin- 625IU on 'Day Stay National Medication Chart'.
- Take blood for antibodies as part of 'Subsequent Antenatal bloods' and request a copy of results to LMC.
- No need to wait for results of blood test.
- Administer Anti-D immunoglobulin *
- Document in Healthware under 'Assessment visit'- verify visit
- Update risk sheet in Healthware
- Woman waits 20 minutes, then free to leave if no reaction
- LMC follows up blood results and actions as required.
- A second dose should be given if the first dose is given prior to 34 weeks gestation. The time for the second dose should be halfway between the first dose and EDD. #
- LMC arranges with woman to return for second dose.

  No bloods required prior to second dose of Anti D immunoglobulin.

* Stock of Anti-D immunoglobulin 625IU will be held at GLCC for this purpose.

'Request for replacement of blood product transfused from stock' form must be completed on the day of administration and returned to NZBS so Anti-D can be registered against the woman and a replacement issued.

No form, no replacement.

Recommendation from NZBS - Dr Richard Charlewood

Appendix 3: Operational process

The following processes are to be followed:

- Routine prophylactic Anti-D can be administered at the maternity clinic, Greenlane Clinical Centre (GCC), Day assessment unit (DAU) at Auckland City Hospital or at the LMC's rooms.
- At the maternity clinic, the vaccination nurses will administer the Anti-D.
- Women will be given a pack by their LMC with the necessary information and forms required to make an appointment to receive her routine antenatal prophylactic Anti-D.
- It will be the responsibility of the LMC to ensure that they and the woman have signed the two consent forms and two doses of Anti-D immunoglobulin 625 IU are prescribed, one on each of the National day stay prescription charts in the packs. The LMC is also responsible to give the woman a form to have her subsequent antenatal bloods taken prior to her appointment.
- The woman is required to have her subsequent blood test at least 48 hours prior to her appointment.
- On the day prior to the woman's appointment the person administering the Anti-D will check the blood results.
- At the maternity clinic, the nurse will order the Anti-D 625 IU for next day delivery using the Blood Bank Issue Sheet (CR7029). The form will include the, dose required, woman's gestation and the 'Prophylactic Anti D' stamp.
    - The Anti-D immunoglobulin will be delivered to NZBS approved fridge in Greenlane Surgical unit (GSU) and moved to the NZBS approved fridge in the maternity clinic by one of the vaccination nurses on the day of the woman's appointment.
- At the DAU clinic, the midwife will order the Anti D on the same day as the woman's appointment using the same process.
- If a woman does not attend her appointment, she should be contacted and another appointment arranged as soon as possible.
- If the woman does not wish to arrange another appointment, document this in Health ware and notify her LMC.
- If the woman arrives and has not had her subsequent bloods, take the blood test and administer the Anti-D immunoglobulin. No need to wait for the results if the woman consents to proceed.
- If the woman arrives for her appointment and has forgotten or miss laid her consent forms and or National Day Stay Prescription sheet:
    - At the maternity clinic, the vaccination nurse will ask for assistance from the community midwives in the maternity walk in centre to re-consent the woman and prescribe the Anti-D immunoglobulin.
    - At DAU the midwife on shift, can re-consent the woman and prescribe the Anti-D immunoglobulin.
- Anti-D is administered according to Auckland DHB guideline: 'Blood Components and Blood Products Administration'.
- Documentation in Heathware will require two entries:
    - Document as an assessment that routine antenatal prophylactic Anti-D 625 IU has been administered.
    - Start or update risk sheet to indicate routine antenatal prophylactic Anti-D 625 IU has been administered and the gestation.

- By verifying the assessment screen in Health Ware the LMC will be notified of the woman's visit

- A process will be developed between NZBS and the Maternity clinic, GCC that covers the stock levels, correct ordering process , storage and return of Anti-D immunoglobulin
- An audit of this process will occur six months after implementation.