

Rh D negative women and pregnancy

Clinical Guideline Presentation v1



45 minutes

Towards CPD Hours

References:

Queensland Clinical Guideline: Rh D negative women and pregnancy is the primary reference for this package.

Recommended citation:

Queensland Clinical Guidelines. Rh D negative women and pregnancy clinical guideline education presentation E23.74-1-V1-R28. Queensland Health. 2023.

Disclaimer:

This presentation is an implementation tool and should be used in conjunction with the published guideline. This information does not supersede or replace the guideline. Consult the guideline for further information and references.

Feedback and contact details:

M: GPO Box 48 Brisbane QLD 4001 | **E:** guidelines@health.qld.gov.au | **URL:** www.health.qld.gov.au/qcg

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Objectives

- Understand the pathogenesis and outcomes when Rh D negative woman is alloimmunised
- Identify the antenatal and postnatal blood tests offered to recognise and manage Rh D negative women
- Identify when prophylactic Rh D Ig is recommended during pregnancy

Objectives

- Identify and understand the management of sensitising events
- Understand Rh D immunoglobulin products available and their use
- Understand the care of the baby born to an Rh D negative woman

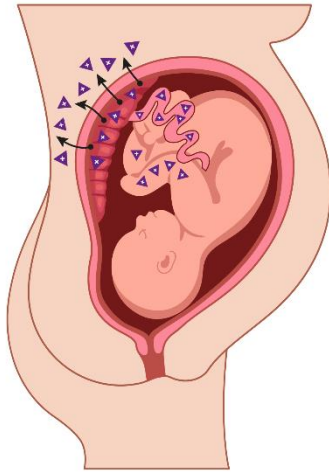
Abbreviations

APH	Antepartum haemorrhage	HDFN	Haemolytic disease of the fetus and newborn		
CVS	Chorionic villus sampling	Ig	Immunoglobulin		
DAT	Direct antiglobulin test	IM	Intramuscular		
DCT	Direct Coombs test	IU	International units		
DNA	Deoxyribonucleic acid	IV	Intravenous		
ECV	External cephalic version	NIPA	Non-invasive prenatal analysis		
FMH	Feto-maternal haemorrhage	NIPT	Non-invasive prenatal test		
Hb	Haemoglobin	ToP	Termination of pregnancy		
<	Less than	>	Greater than	≥	Greater than or equal to

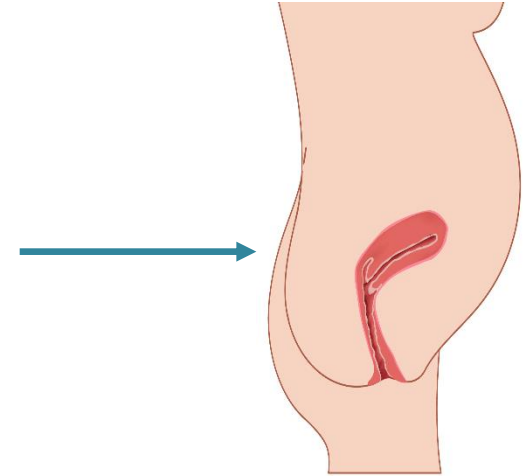
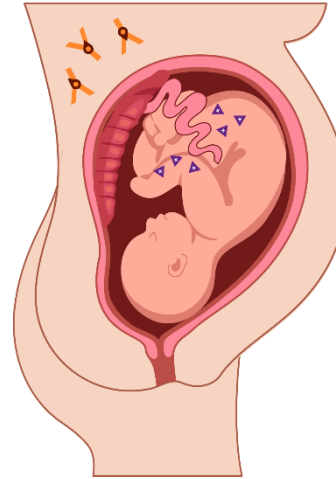
Definitions

Alloimmunisation	Rh D negative woman's immune system response to Rh D positive fetal red blood cells expressing the Rh D antigen
Anti-D antibody	Rh D antibodies <ul style="list-style-type: none">• Passive antibodies—come from an external source (e.g. Rh D immunoglobulin)• Preformed antibodies—develop after sensitising event when Rh D negative woman exposed to Rh D positive red cells
Rh D Ig	Product administered to Rh D negative woman who has no preformed antibodies
Rh D positive person (previously known as Rhesus positive)	Carries D antigen on their red cells
RHD	Gene that encodes Rh D blood type Refers to the genotype in the fetus

What happens when Rh D immunoglobulin is administered?



Rh D immunoglobulin is administered



Rh D negative woman with Rh D positive baby has sensitising event

Rh D immunoglobulin for prophylaxis and after sensitising events neutralises the Rh D antigen and prevents antibodies developing

After pregnancy the woman does not have antibodies from Rh D positive baby

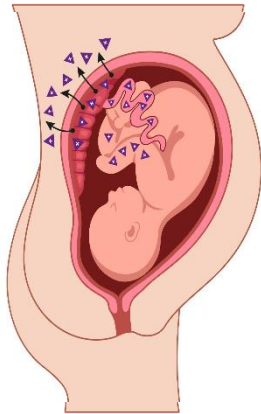


Red blood cells



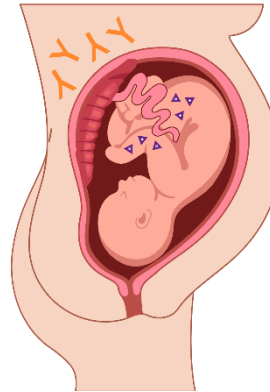
Rh D antibody with Rh D immunoglobulin attached

What happens when Rh D immunoglobulin is not administered?

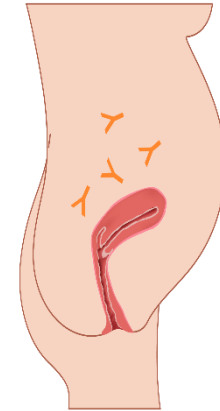


Rh D negative woman with Rh D positive baby has sensitising event

Rh D immunoglobulin is **NOT** administered



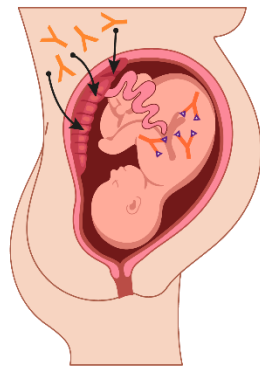
If Rh D immunoglobulin has not been given, the woman develops antibodies



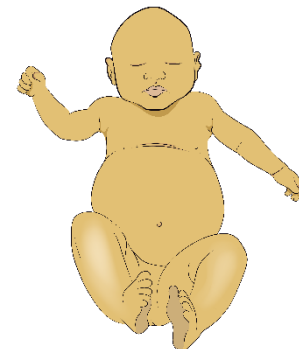
After pregnancy the antibodies remain

Next pregnancy

- RBC
- Antibody to Rh D antigen
- Antibody to Rh D antigen attached to Rh D positive RBC



In the next pregnancy, if the baby is Rh D positive, antibodies cross the placenta and damage the baby's RBC



Baby may develop HDFN, hydrops fetalis, fetal thrombocytopenia and develop jaundice

Amira attends antenatal clinic for her booking-in appointment in her first pregnancy. She mentions she is a blood donor and her blood group is A negative.

What care is offered to an Rh D negative woman?

- History to identify Rh D alloimmunisation risk (previous baby known to have HDFN or blood transfusion)
- Information about being Rh D negative and fetal/neonatal risk
 - Provide QCG consumer information

What information do you give Amira about risk factors for alloimmunisation?



- These include:
 - Rh D negative woman has an Rh D positive fetus
 - Sensitising event during pregnancy and birth
 - Incompatible blood transfusion
- If preformed anti-D antibodies are present refer woman for specialist management

What are the neonatal risks from maternal alloimmunisation?

- Severe anaemia resulting from haemolytic disease of the fetus and newborn (HDFN)
 - If anti-D level > 4 IU per mL and < 15 IU per mL—moderate risk of HDFN (unlikely to be severe)
 - If anti-D level > 15 IU per mL—risk of severe HDFN
- Hydrops fetalis
- Fetal thrombocytopenia

What blood tests are offered?



- Blood tests
 - ABO Rh D group
 - If Rh D negative, antibody screen for preformed anti-D antibodies
 - Fetal RHD (NIPA/NIPT) if:
 - Preformed anti-D antibodies
 - Previous obstetric history (severe FMH, intra-uterine fetal death)
 - Non-sensitised but relative contraindication to Rh D Ig (e.g. prior allergic reaction)

What do you discuss with Amira about sensitising events that occur in the first 12+6 weeks

- Miscarriage
- Surgical termination of pregnancy (ToP)
- Medical ToP after 10+0 weeks
- Ectopic pregnancy
- Molar pregnancy
- Chorionic villus sampling (CVS)



Sensitising events from 13 weeks

- Genetic studies—CVS, amniocentesis, cordocentesis
- Abdominal trauma
- Antepartum haemorrhage (APH)—revealed or concealed
- External cephalic version (ECV)—successful or attempted
- Miscarriage or ToP
- Birth of baby

Amira asks when she will receive Rh D Ig.

What information do you give Amira?

- Rh D Ig is administered:
 - Prophylactically at 28 and 34 weeks gestation—
if no preformed antibodies and fetal RHD known
to be Rh D positive or not known
 - Following sensitising event(s) including if
antibody status not known

What type and doses of anti-D Ig are available? How are they administered?

- Rh (D) immunoglobulin VF
 - Routine prophylaxis and sensitising event(s)
 - If < 13 + 0 weeks: 250 IU IM injection
 - If \geq 13 weeks: 625 IU IM injection
 - Deep, slow intramuscular (IM) injection in deltoid or anterolateral thigh
 - **Not** for IV administration (draw back on syringe)
 - Divided dose if > 5 mL volume (round up to nearest full vial)



Anti-D immunoglobulin

- Rhophylac[®]
 - Indicated for large FMH > 6 mL
 - Volume of Rh D immunoglobulin > 5 mL or there is a contraindication
(e.g. previous allergic reaction to Rh (D) immunoglobulin VF)
 - Intravenous (IV) injection from prefilled syringe



Amira presents at 28 weeks for her first injection of Rh D Ig.

After providing information and education, and obtaining informed consent, how is Rh D Ig administered?

- Bring to room temperature just prior to administration
- Observe woman for 20 minutes after administration
- If BMI ≥ 30 kg/m²
 - No additional doses required
 - Consider administration site and needle length (deltoid suggested)

Amira presents with some bleeding at 32 weeks gestation.

What management is recommended after a sensitising event?

- Check bloods—group (if required), and anti-D antibodies
- Quantify size of fetomaternal haemorrhage (FMH) from 20+1 weeks by flow cytometry or Kleihauer-Betke
- Administer Rh D Ig after blood sample as soon as possible (do not wait for test results)

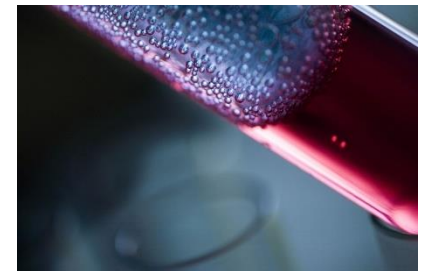
Management of sensitising event

- If large FMH (≥ 6 mL), repeat quantitative test
 - 48 hours after IV Rh D Ig
 - 72 hours after IM Rh D Ig
- Postnatally
 - If baby Rh D positive, maternal blood 45 minutes after birth and within 72 hours
 - Collect maternal blood before Rh D Ig is administered

At 40+3 weeks gestation Amira gives birth to a well baby boy.

What neonatal care is recommended for Amira's baby?

- Check Rh D group and direct antiglobulin test (DAT) from cord blood of **all** babies born to Rh D negative women
 - Regardless of immunoprophylaxis or alloimmunisation
 - Includes if non-invasive prenatal test (NIPT) predicted Rh D negative baby



Neonatal care

- If clinically significant antibodies in woman or increased risk of haemolysis
 - Cord blood for haemoglobin (Hb) and bilirubin
- Usual newborn care
- If alloimmunised mother assessment of:
 - Neurobehavioural state
 - Jaundice
 - Anaemia

