# 15 Immune Anti-D in Pregnancy: Cases reported up to the end of 2016: More questions than answers so far

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**Questions arising from the data:**

- Do twin pregnancies pose a higher risk of alloimmunisation during pregnancy as well as the already recognised risk of increased fetomaternal haemorrhage at delivery?
- Should laboratories proactively chase up cases where anti-D immunoglobulin (Ig) prophylaxis has been issued but confirmation of administration is not received?
- Why does apparently 'ideal' care result in immunisation in some cases? Data from National Health Service Blood and Transplant (NHSBT) Alloimmune Resource (AIR) study (looking for genetic influences that predispose women to developing red cell alloantibodies during pregnancy) may be informative to identify women at higher risk of immunisation
- Should obese women receive modified routine antenatal anti-D Ig prophylaxis (RAADP) - higher or more frequent dosing, or intravenous administration?
- Should extra doses of RAADP be given to women whose pregnancy extends beyond 40 weeks?
- Is anti-D Ig prophylaxis indicated for medical termination with no instrumentation?
- How do we encourage reporters to send in fully completed datasets?

## Key SHOT messages

- The terms 'standard dose' and 'higher dose' of anti-D Ig should be avoided in any guidance issued, and the minimum recommended dose for each clearly specified clinical scenario should be given in international units (IU)
- All healthcare professionals, including laboratory staff, are responsible for ensuring that women who become immunised to the D antigen in pregnancy are reported to SHOT with an accurate and complete dataset

## Recommendation

- United Kingdom (UK) guidance for use of anti-D Ig prophylaxis from both National Institute for Health and Care Excellence (NICE 2008 and 2012) and British Society for Haematology (BSH 2014) should be reviewed to avoid conflicting and thus confusing advice, especially in early pregnancy

**Action: BSH Guidelines Transfusion Task Force**

## Introduction

To improve understanding of the causes of continuing anti-D immunisations, SHOT is conducting a prospective study of women who have produced alloimmune anti-D detected for the first time in the current (index) pregnancy.

## Results

In 2016 a total of 40 cases were reported, although some datasets were incomplete (only 14 (35.0%) datasets were satisfactorily completed at initial submission, in the other cases SHOT staff had to contact the reporter for more details or clarifications). There were 9 cases in women with no previous pregnancies (NPP) and 31 in women with previous pregnancies (PP), 28 of which resulted in live birth. Cumulatively SHOT now has data on 42 women with no previous pregnancy (NPP) and 115 women with previous pregnancies (PP).

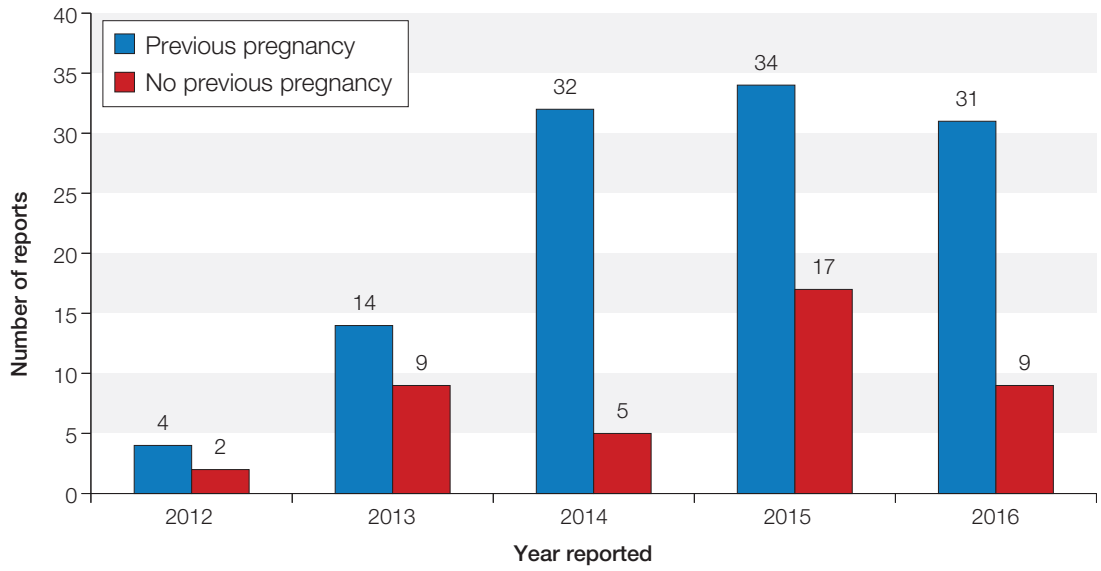


**Figure 15.1: Number of reports of anti-D immunisation in pregnancy by year, 2012-2016**

## No previous pregnancy (NPP) n=9 in 2016, cumulative n=42

### When was the anti-D detected?

| | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| Before 28 weeks | 0 | 4 |
| At or after 28 weeks, before delivery | 4 | 11 |
| At delivery | 4 | 25 |
| Other | 1* | 1 |
| No information | 0 | 1 |
| **Total** | **9** | **42** |

**Alloimmune anti-D was detected 6 months postpartum after large fetomaternal haemorrhage (FMH) of 12.7mL at delivery managed correctly*

**Table 15.1: When immune anti-D was detected NPP**

### What was the booking weight?

| Weight at booking in kg | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| <68 | 5 | 21 |
| 68-80 | 0 | 4 |
| >80 (obese) | 3 | 7 |
| No information | 1 | 10 |
| **Total** | **9** | **42** |

**Table 15.2: Booking weight NPP**

## Did the women receive appropriate RAADP?

Table 15.3: Details of RAADP for eligible NPP cases n=9 (2016) n=39 (cumulative)

| RAADP regimen | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| Single dose 1500IU at 28 weeks | 7 | 33 |
| Single dose 1500IU at 30 weeks | 2 | |
| Two-dose regimen 500IU | 0 | 1 |
| Not given | 0 | 5 |
| **Total** | **9** | **39** |

The route was specified in 6 cases from 2016 as intramuscular into deltoid, one case into gluteal region and the rest were not specified.

## Details of potentially sensitising events (PSE)

Table 15.4a: Details of PSE NPP n=9

| Number of cases | PSE | Management |
|---|---|---|
| 7 | None | |
| 1 | Twin pregnancy | |
| 1 | Large FMH at delivery | Appropriate anti-D Ig dose and follow up.<br>Immune anti-D detected at 6-month follow up |

Table 15.4b: Details for all PSE NPP cases reported since 2012

| PSE | Number of cases |
|---|---|
| None | 30 |
| 7 antepartum haemorrhage (APH)<br>2 interventions (chorionic villus sample, amniocentesis)<br>1 fall<br>1 large FMH at delivery<br>1 twin pregnancy | Some women had more than one PSE |

## Pregnancy outcomes

In 2016 all 9 pregnancies resulted in 10 live births (one twin pregnancy) of which 2 babies were D-negative, 7 had no complications, and 1 case required exchange transfusion.

Cumulatively, all 42 pregnancies resulted in 43 live births, of which 27 had no complications, 11 babies required phototherapy and 4 cases required exchange transfusion. No details were given in one case.

# Summary of 2016 NPP data

The majority of women (8/9) were found to be immunised during the third trimester or at delivery, and all received apparently 'ideal' care, with timely RAADP and no identifiable sensitising episodes. In 3 cases the women were obese, and one pregnancy delivered beyond term at 41 weeks. There was one twin pregnancy, one where RAADP administration was incompletely documented but otherwise received 'ideal' care and one where information on booking weight was missing. One further case had alloimmune anti-D detected 6 months postpartum after a large FMH at delivery which was apparently managed correctly with increased dose of postpartum anti-D Ig and appropriate follow up.

## Case studies:

### Case 15.1: Twin pregnancy

*Primipara aged 26 years. Booking weight 66kg (body mass index (BMI) 22.8). Received RAADP (single dose of 1500IU anti-D Ig at 28 weeks by intramuscular injection into deltoid region). Alloimmune anti-D was detected (15.4IU/mL) at 36 weeks when she delivered twins. Twin one (D-positive) required exchange transfusion, twin two was D-negative.*

**Question:** Do twin pregnancies pose a higher risk of alloimmunisation during pregnancy as well as the already recognised risk of increased fetomaternal haemorrhage at delivery?

**Case 15.2: Incomplete documentation of RAADP administration**

*Primipara aged 20 years. Booking weight 57.7kg (BMI 24). Antenatal notes document that she received RAADP (1500IU anti-D Ig at 31 weeks) but the batch number and confirmation of transfusion form was not logged and the form was not returned to the transfusion laboratory. Alloimmune anti-D was detected (13.9IU/mL) at delivery at 38 weeks. The baby required no interventions for haemolytic disease of the fetus and newborn (HDFN).*

**Question:** Should laboratories proactively chase up cases where anti-D Ig has been issued but confirmation of administration is not received?

**Case 15.3: Apparently 'ideal' care but obese**

*Primipara aged 25 years. Booking weight 107kg (BMI 36.95). Received RAADP (single dose of 1500IU anti-D Ig at 28 weeks by intramuscular injection into deltoid region). Alloimmune anti-D was detected (3.8IU/mL) at delivery at 40 weeks. The baby required no interventions for HDFN.*

**Question:** Should obese women receive modified RAADP-higher or more frequent dosing, intravenous administration?

**Case 15.4: Apparently 'ideal' care**

*Primipara aged 26 years. Booking weight 59.4kg (BMI 24). Received RAADP (single dose of 1500IU anti-D Ig at 28 weeks). Alloimmune anti-D was detected (1.9IU/mL) at 29 weeks, peaking to a level of 4.8IU/l at 36 weeks gestation. There were no PSE. The baby was delivered at 37 weeks and required no interventions for HDFN.*

**Question**: Why does apparently 'ideal' care result in immunisation in some cases? Data from the NHSBT AIR study (looking for genetic influences that predispose women to developing red cell alloantibodies during pregnancy) may be informative to identify women at higher risk of immunisation.

## Previous pregnancies (PP) n=31 in 2016, cumulative n=115 cases

### When was the anti-D detected in index pregnancy?

| Time of anti-D detection | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| At booking (if first trimester) | 9 | 50 (43.5%) |
| After booking to 28 weeks (includes late booking) | 2 | 4 |
| At or after 28 weeks | 10 | 39 (33.9%) |
| At delivery | 9 | 16 (13.9%) |
| Other | 1* | 6** |
| **Total** | **31** | **115** |

Table 15.5: When immune anti-D was detected PP

*One at preoperative assessment 15 months after pregnancy

**Two at preoperative assessment following pregnancy, two at planned follow up of large FMH at delivery where correct dose of anti-D Ig had been given, two unknown

Where alloimmune anti-D was detected at booking in the index pregnancy, only the events in the preceding pregnancy are relevant to the sensitisation (assuming no other exposure to the D antigen occurred e.g. transfusion, an unlikely event in healthy fertile women). Where anti-D is detected later in the index pregnancy, the relative contribution of events in the previous and index pregnancy is less certain.

## Information about the pregnancy immediately preceding index pregnancy

In 2016 one woman underwent medical termination of her third pregnancy at 9 weeks and received 250IU anti-D Ig, another case underwent a termination (TOP) but no further details were available, one woman sustained fetal loss at 8 weeks gestation with no surgical intervention, leaving 28 cases that proceeded to live birth.

## Did the women receive appropriate anti-D Ig prophylaxis for pregnancy loss?

One woman received an appropriate dose (250IU) of anti-D Ig after medical termination at 9 weeks, one required no anti-D Ig after early (8 week) spontaneous fetal loss and no information was available in the other woman who underwent a termination.

## What was the booking weight in the preceding pregnancy?

Table 15.6: Booking weight for PP cases

| Weight at booking in kg | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| <68 | 8 | 36 |
| 68-80 | 2 | 11 |
| >80 (obese) | 5 | 14 |
| No information | 13 | 41 |
| **Total** | **28** | **102*** |

**13 cases did not go to term*

## Did the women who carried to term receive RAADP in the preceding pregnancy?

Table 15.7: Details of RAADP PP

| RAADP | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| Single dose | 17 | 60 |
| Two doses | 0 | 7 |
| Not given | 1* | 16** |
| No information | 10 | 19 |
| **Total** | **28** | **102** |

**Before practice adopted*

***Learning difficulties, concealed pregnancy, needle phobic, prior to RAADP introduction (3), delivered abroad (3), no reason given (5), declined (2)*

In 8 cases the route was specified as deltoid, in the other cases it was not known.

## Details of potentially sensitising events in the preceding pregnancy

Table 15.8: Details of potentially sensitising events PP

| Number of PSE | Details |
|---|---|
| 8 PSE reported | • 2 APH (33 weeks and 30 weeks) both managed correctly with Kleihauer test and correct timely dose of anti-D Ig<br>• 1 spontaneous miscarriage at 8 weeks, no anti-D Ig indicated<br>• 2 TOP: 1 no information, 1 managed correctly with 250IU anti-D Ig<br>• 3 falls/abdominal trauma (19, 34 and 37 weeks) managed correctly with Kleihauer test and correct timely dose of anti-D Ig |
| 12 cases had no PSE reported<br>10 cases had no information on PSE | |

Since reporting began in 2013, a total of 28 PSE have been reported in the preceding pregnancies of which 19 (67.9%) were correctly managed.

## Method of delivery of preceding pregnancy

| Type | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| No information | 12 | 40 |
| Vaginal | 9 | 37 |
| Instrumental | 2 | 6 |
| Elective caesarean section (CS) | 3 | 8 |
| Emergency CS | 2 | 11 |
| **Total** | **28** | **102** |

Table 15.9: Mode of delivery for PP cases

## Gestation more than 40 weeks at delivery of preceding pregnancy

| Gestation at delivery (weeks) | Number of new cases 2016 |
|---|---|
| 40 weeks or less | 12 |
| More than 40 weeks | 1 case $40^{+3}$<br>2 cases $40^{+5}$<br>2 cases $40^{+7}$<br>1 case 41 |
| No information | 10 |
| **Total** | **28** |

Table 15.10: Gestation at delivery PP

Cumulatively (data collected from 2015 onwards), 9/58 pregnancies (15.5%) in PP women who became immunised lasted more than 40 weeks. NHS maternity statistics 2014-2015 indicate 17.5% pregnancies extended beyond 40 weeks (NHS Digital 2015).

## Postpartum prophylaxis (PPP) in preceding pregnancy

| What happened? | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| Kleihauer test and appropriate dose of anti-D Ig | 12 | 62* |
| No prophylaxis | 1 | 6** |
| Incorrect dose of anti-D Ig | 0 | 2*** |
| No information | 12 | 27 |
| D-negative baby | 3 | 5 |
| **Total** | **28** | **102** |

Table 15.11: Details of postpartum anti-D Ig prophylaxis PP

*Includes 4 cases requiring higher doses as a result of Kleihauer test*

***2 from overseas, 1 with learning difficulties, 1 needle-phobic, 1 declined*

****1 dose 250IU, 1 dose given late*

## Anti-D detected at first trimester booking of index pregnancy n=9

The details of the preceding pregnancy may provide information on the cause of immunisation in these cases.

Table 15.12: Details of management in previous pregnancy n=9

| Details | Details of preceding pregnancy |
|---|---|
| Case 002* | Not obese, correct RAADP, no PSE, delivery route not specified, correct PPP |
| Case 004 | Delivered by caesarean section, no other information provided |
| Case 005* | Medical termination of pregnancy at 9 weeks, 250IU anti-D Ig given |
| Case 011* | Not obese, correct RAADP, no PSE, delivered by caesarean section at 36 weeks gestation, correct PPP |
| Case 014 | TOP, no other details known |
| Case 018 | No further information available |
| Case 021 | Booking weight not known, RAADP not given as before policy introduced, APH correctly managed, vaginal delivery, no information on PPP |
| Case 024* | Booking weight not reported, correct RAADP, no PSE. Weak anti-D detected at term and confirmed at 3 months which was at booking for next pregnancy |
| Case 026* | Not obese, correct RAADP, fall at 34 weeks correctly managed, vaginal delivery but no PPP as baby D-negative, alloimmune anti-D detected at booking of index pregnancy at very low level, D-negative baby |

**Cases with apparently 'ideal' management with no risk factors*

Missing data for these cases make analysis difficult, but as in NPP reports there are cases where apparently 'ideal' management with no risk factors still resulted in immunisation.

## Anti-D detected after first trimester in index pregnancy n=21

Further information is requested about the index pregnancy when alloimmune anti-D is detected after the booking (first trimester) sample, as it may be that the sensitisation occurred in the index pregnancy rather than in the preceding pregnancy.

## What was the booking weight in the index pregnancy?

Table 15.13: Booking weight in index pregnancy PP

| Weight at booking in kg | Number of new cases 2016 | Number of cases cumulative total |
|---|---|---|
| <68 | 9 | 27 |
| 68-80 | 2 | 10 |
| >80 | 5 | 7 |
| No information | 5 | 15 |
| **Total** | **21** | **59** |

## RAADP in index pregnancy

Table 15.14: Details of RAADP in index pregnancy PP

| RAADP given or not | Number |
|---|---|
| Single dose 1500IU | 11 |
| RAADP given but no details | 3 |
| Not given: | |
| Late booker: alloimmune anti-D present at 28 week visit | 6 |
| No clinic appointment made | 1 |
| **Total** | **21** |

## Details of potentially sensitising events in index pregnancy

| Number of women | Details |
|---|---|
| 8 cases where PSE reported | • Fall at 33 weeks, no Kleihauer test performed, no anti-D Ig given<br>• APH at 15 weeks, 500IU anti-D Ig given<br>• External cephalic version (? gestation), Kleihauer test negative, 1500IU anti-D Ig given<br>• APH at 18 weeks, 250IU anti-D Ig given<br>• Abdominal trauma at 16 weeks, 250IU anti-D Ig given; fall at 32 weeks, no Kleihauer test performed and no anti-D Ig given<br>• APH at 30 weeks, Kleihauer test negative, 1500IU anti-D Ig given<br>• Abdominal trauma (road traffic accident) at 18 weeks, no anti-D Ig given<br>• APH at 23 weeks, Kleihauer test negative 500IU anti-D Ig given |
| 8 cases no PSE reported | |
| 5 cases no information on PSE | |

**Table 15.15: Details of potentially sensitising events in index pregnancy PP**

## Outcomes of pregnancies reported in 2016

| Outcome | Number of cases |
|---|---|
| Live births | 28 |
| *No treatment (5 D-negative babies)* | *15* |
| *Required phototherapy* | *11* |
| *Required phototherapy and intravenous immunoglobulin* | *1* |
| *Required phototherapy and exchange transfusion* | *1* |
| No information | 2 |
| Not pregnant: anti-D detected at follow up of previous pregnancy | 1 |

**Table 15.16: Outcome of pregnancies reported in 2016 PP**

# Summary of 2016 PP data

In 9 cases women were found to be immunised at the first trimester booking indicating that sensitisation had probably occurred in the preceding pregnancy. Although the data are incomplete, we continue to see cases where despite apparently 'ideal care' in the preceding pregnancy, sensitisation to the D antigen occurs and alloimmune anti-D develops in the subsequent pregnancy. Cumulatively since data collection began in 2012, 18/50 PP cases (36.0%) found to be immunised at booking received apparently 'ideal care' in the preceding pregnancy.

In 6/28 of the previous pregnancies to term (21.4%) lasted longer than 40 weeks and cumulatively, since 2015, 9/58 pregnancies (15.5%) in PP women who became immunised lasted longer than 40 weeks. **Should extra doses of RAADP be given to women whose pregnancy extends beyond 40 weeks?**

NHS maternity statistics 2014-2015 show 17.5% pregnancies extended beyond 40 weeks (NHS Digital 2015).

In 21 cases alloimmune anti-D was detected later in the index pregnancy so that the relative contribution of previous pregnancies is less clear.

## Case studies

### Case 15.5: Medical termination of early pregnancy with apparent failure of prophylaxis

*A woman had two previous live births with no alloimmune anti-D detected at the second delivery. She then had a medical termination of pregnancy (MTOP) at 9 weeks gestation. A sample for group and antibody screen could not be obtained. Anti-D Ig (250IU) was given following the MTOP. At booking for her next pregnancy alloimmune anti-D (29IU/mL) was detected. The baby was D-negative.*

**Case 15.6: Obesity**

*Preceding pregnancy booking weight 149kg (BMI 50.4). RAADP administered at 28 weeks gestation (1500IU intramuscularly into deltoid area). Antepartum haemorrhage occurred at 30 weeks with negative Kleihauer, 1500IU anti-D Ig given intramuscularly into deltoid area within 24 hours of event. D-positive baby delivered by caesarean section at 37 weeks gestation. Postpartum prophylactic anti-D Ig (500IU) was given. Anti-D was detected 15 months later when the woman attended the emergency department with abdominal pain.*

3/9 NPP women were obese (booking weight >80kg), as were 5/28 PP women in their preceding pregnancy and 5/21 PP women in their current pregnancy. None received prophylactic anti-D Ig intravenously.

**Question:** Should obese women receive modified RAADP: higher or more frequent dosing, intravenous administration?

**Case 15.7: Early fetal loss**

*The preceding pregnancy ended in early fetal loss at 7-8 weeks gestation. This was treated medically with no surgical intervention. In the index pregnancy, no alloimmune anti-D was detected at booking at 10 weeks. Alloimmune anti-D was detected at 28 weeks (12.4IU/mL). The baby was delivered at 36 weeks gestation and required phototherapy and exchange transfusion.*

**Question:** Is anti-D Ig prophylaxis indicated for early medical termination with no instrumentation?

## Conclusion

The SHOT anti-D immunisation dataset continues to expand as more cases are reported each year. In some, an obvious error is identified and indeed, in Chapter 14, Adverse Events Related to Anti-D Immunoglobulin (Ig) of this year's report, 409 reports related to errors involving anti-D Ig are reviewed, of which 81.4% relate to the omission or late administration of anti-D Ig, putting these women at risk of sensitisation.

There is guidance on the use of anti-D Ig prophylaxis from the National Institute for Heath and Care Excellence (NICE 2008 and 2012) and the British Society for Haematology (BSH Qureshi et al. 2014). However, despite the use of prophylactic anti-D Ig (both RAADP and post sensitising events) being founded on sound research and approved by BSH and NICE, a number of questions remain and are highlighted by the immunisation data reported here, including whether obesity, gestation beyond term and twin pregnancies require additional doses of anti-D Ig. While the Royal College of Obstetricians and Gynaecologists green top guidance has been archived in favour the BSH guideline, we are concerned that the guidance from BSH and NICE related to events in early pregnancy is not identical, with BSH recommending prophylaxis for ectopic pregnancies whereas NICE does not recommend anti-D Ig prophylaxis where the ectopic pregnancy is medically managed. Similarly, BSH advises anti-D Ig in some cases of threatened miscarriage where NICE guidance does not.

SHOT experts are also aware some centres have developed 'bespoke' guidance containing terms such as 'standard dose' and 'higher dose' anti-D Ig. Such terms should be avoided in any guidance issued, and the minimum recommended dose for each clearly specified clinical scenario should be given in international units (IU) to avoid confusion.

The SHOT data suggest that even where 'ideal' care in terms of anti-D Ig prophylaxis has been given during the previous or index pregnancy, women can become sensitised/immunised. Data from the NHSBT AIR* study (looking for genetic influences that predispose women to developing red cell alloantibodies during pregnancy) may be informative to identify women at higher risk of immunisation.

The responsibility for ensuring women receive appropriate, timely and adequate anti-D Ig prophylaxis (both RAADP and following PSE) must be shared between the woman herself, midwifery and obstetric services, other departments the pregnant woman may be in contact with, including general practice and emergency care, and transfusion laboratories who issue anti-D Ig. One question arising from this year's data is whether transfusion laboratories should proactively chase up cases where antenatal anti-D Ig

prophylaxis has been issued but confirmation of administration is not received. Appendices 15.1 and 15.2 show examples of such good practice.

All healthcare professionals, including laboratory staff, involved in the care of pregnant women must be encouraged to send in fully completed datasets on newly identified cases of anti-D immunisation in pregnancy, as the SHOT anti-D immunisation data may be the only way the important questions posed at the beginning of this chapter will be answered, particularly why women with apparently ideally managed pregnancies are still becoming immunised.

***The AIR study for pregnant women with red cell antibodies**

The AIR study is a research project funded by NHSBT and aims to collect 2000 deoxyribonucleic acid (DNA) samples from alloimmunised women for a genome wide screening study to identify genes that may enhance the likelihood of antibody production.

## References

BSH Qureshi H, Massey E et al. (2014) **Guideline for the use of anti-D immunoglobulin for the prevention of haemolytic disease of the fetus and newborn.** Transfus Med 24(1), 8-20 http://onlinelibrary.wiley.com/doi/10.1111/tme.12091/full [accessed 20 February 2017]
(Note: Royal College of Obstetricians and Gynaecologists green top guideline on use of anti-D Ig has been archived and replaced by BSH guideline)

BSH Austin E, Bates S et al. (2009) **Guidelines for the estimation of fetomaternal haemorrhage.** http://www.b-s-h.org.uk/guidelines/guidelines/the-estimation-of-fetomaternal-haemorrhage/ [accessed 07 February 2017]

National Institute for Health and Care Excellence (NICE) (2008) **Routine antenatal anti-D prophylaxis for women who are rhesus D negative. Technology Appraisal Guidance No. 156.** https://www.nice.org.uk/Guidance/TA156 [accessed 20 February 17]

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NHS Digital (2015) **NHS Maternity Statistics - England, 2014-15.** http://content.digital.nhs.uk/catalogue/PUB19127 [accessed 03 May 2017]

## Appendices

| Description of Test |
|---|
| Take action **BEFORE 72 hours** has passed from a potentially sensitising event |
| 1. Contact the ward responsible for the patient, if unable to identify the ward responsible for the patient go to step 2 |
| 2. Ask a senior member of staff to locate patient using LE 2.2, if unable to identify the ward responsible for the patient go to step 3 |
| 3. Contact the Gynaecology Registrar & inform a senior member of transfusion staff. (There is an agreement in place with the Obstetric Department to escalate to the gynaecology registrar if a woman cannot be located and is at risk of breaching the 72 hour deadline) |

**Appendix 15.1: Example of the escalation process for transfusion laboratory staff if a patient cannot be located and is at risk of breaching the 72-hour deadline for the administration of anti-D Ig**

**Appendix 15.2: Example of the procedure for requesting anti-D immunoglobulin from the transfusion laboratory**