## Haematology audit template

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| Date of completion  | (To be inserted when completed) |
| Name of lead author/participants | (To be inserted) |
| Specialty | Haematology |
| Title | **An audit of compliance with the British Society for Haematology guideline for****the management of conception and pregnancy in thalassaemia syndromes** |
| Background | The British Society for Haematology (BSH) has published guidance on the management of conception and pregnancy in thalassaemia syndromes.1 This audit will review compliance with some of the main recommendations made. |
| Aim & objectives | To review whether:* conception and pregnancy in patients with thalassaemia are being managed in an appropriate way
* investigations are being performed appropriately.
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| Standards & criteria | **Criteria range:** 100%, or if not achieved, there is documentation in the case notes that explains the variance.**Assessment and management of patients with hypogonadism needing spermatogenesis induction*** Gonadal status should be assessed in all patients with thalassaemia, commencing at the age of puberty, in conjunction with paediatric endocrinologists.
* If gonadotrophin therapy is required for spermatogenesis induction, regular monitoring of response should be undertaken, with reduction or increase of dose, or additional therapy added as indicated.
* Assisted conception should be considered where spermatogenesis is achieved, and natural conception has not occurred by 12 months, or sooner when the female partner is in her mid-30s or older.
* Unless microsurgical testicular sperm extraction is being considered, gonadotrophin treatment can be withdrawn, and testosterone replacement commenced in patients remaining azoospermic after 24 months of combined human chorionic gonadotrophin/human menopausal gonadotrophin treatment.

**Assessment and management of patients with hypogonadism needing ovulation induction*** A full fertility workup of both partners should be undertaken prior to any ovulation induction therapy.
* Patients should be fully informed of individualised risk factors both relating to assisted conception, underlying thalassaemia syndrome and any associated complications prior to treatment.
* Patients who have failure of treatment or conception after 6 cycles should be discussed in a multidisciplinary team (MDT) meeting.
* Multiple pregnancy will always be a possible outcome, and patients should not have a trigger injection if more than 2 follicles of greater than 14 mm are present on the day of trigger without clear and documented counselling.

**Management of pregnant patients*** Pregnant patients with thalassaemia should be reviewed monthly until 28 weeks of gestation and fortnightly thereafter. The MDT should provide routine as well as specialist antenatal care.
* Pregnant patients with transfusion-dependent thalassaemia (TDT) who have cardiac T2\* >20 ms prior to conception require specialist cardiac assessment early in the third trimester of gestation and further review thereafter as appropriate.
* Monitor thyroid function in pregnant patients with thalassaemia and hypothyroidism.
* Monitor monthly serum fructosamine in pregnant patients with thalassaemia and diabetes.
* Initiate folic acid 5 mg daily preconceptually to prevent neural tube defects and continue throughout pregnancy.
* Initiate aspirin 75–150 mg daily from 12 weeks.
* Offer an early viability ultrasound scan at 7–9 weeks of gestation.
* Offer serial fetal growth scans every 4 weeks from 24 weeks of gestation.

**Transfusion*** Ensure asymptomatic patients with non-transfusion-dependent thalassaemia have a clear management plan regarding transfusion in late pregnancy in their obstetric care plan.

**Thromboprophylaxis*** Patients with thalassaemia who are splenectomised OR have a platelet count above 600×109/L should be offered low-molecular-weight heparin (LMWH) thromboprophylaxis in addition to low-dose aspirin 75–150 mg daily.
* All pregnant patients with thalassaemia require LMWH during hospital admissions.

**Chelation therapy*** Pregnant patients with existing myocardial iron loading need first-trimester specialist cardiology review.
* Women with myocardial iron loading should undergo regular cardiology review with careful monitoring of ejection fraction during the pregnancy, as signs of cardiac decompensation are the primary indications for intervention with chelation therapy.
* Patients with no myocardial iron loading should be assessed early in the third trimester of gestation to formulate a delivery plan based on cardiology advice.
* Patients presenting with palpitations should be assessed for arrhythmias.
* Those women at highest risk of cardiac decompensation (T2\* <10 ms) should commence low-dose subcutaneous desferrioxamine (DFO; 20 mg/kg/day) on a minimum of 4–5 days a week under joint haematology and cardiology guidance from 20 to 24 weeks of gestation.

**Intrapartum care*** Inform the MDT (senior midwife, senior obstetric, anaesthetic and haematology staff) on admission to the delivery suite.
* If red cell antibodies are present or haemoglobin <100 g/L, crossmatch blood on admission. Otherwise, a blood group and save sample are sufficient.
* Continuous intrapartum electronic fetal heart rate monitoring is recommended.
* Thalassaemia alone is not an indication for a caesarean section.
* Ensure active management of the third stage of labour to minimise blood loss.

**Postpartum care**Splenectomised patients should receive LMWH for 6 weeks after delivery.Assess iron burden at 3 months postpartum unless myocardial iron overload necessitates earlier assessment. |
| Method | **Sample selection**All patients with a diagnosis of thalassaemia major on a regular transfusion programme from the age of 12 to 50 years and patients with non-transfusion dependent thalassaemia from age 12 to 50 years. **Data to be collected on proforma (see below)** |
| Results | (To be completed by the author)The results of this audit show the following compliance with the standards.

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| **Investigation** | **No. audited** | **No. compliant** | **% compliance** |
| **Assessment and management of patients with hypogonadism needing spermatogenesis induction** |
| Gonadal status was assessed in patients with thalassaemia, commencing at the age of puberty, in conjunction with paediatric endocrinologists |  |  |  |
| If gonadotrophin therapy was required for spermatogenesis induction, regular monitoring of response was undertaken, with reduction or increase of dose, or additional therapy added as indicated |  |  |  |
| Assisted conception was considered where spermatogenesis was achieved, and natural conception had not occurred by 12 months, or sooner if the female partner was in her mid-30s or older |  |  |  |
| Unless microsurgical testicular sperm extraction is/was being considered, gonadotrophin treatment was withdrawn, and testosterone replacement commenced in patients remaining azoospermic after 24 months of combined human chorionic gonadotrophin/human menopausal gonadotrophin treatment |  |  |  |
| **Assessment and management of patients with hypogonadism needing ovulation induction** |
| A full fertility workup of both partners was undertaken prior to any ovulation induction therapy |  |  |  |
| Patients were fully informed of individualised risk factors both relating to assisted conception, underlying thalassaemia syndrome and any associated complications prior to treatment |  |  |  |
| Patients who had failure of treatment or conception after 6 cycles were discussed in an MDT meeting |  |  |  |
| Patients did not have a trigger injection if more than 2 follicles of greater than 14 mm were present on the day of trigger without clear and documented counselling |  |  |  |
| **Management of pregnant patients** |
| A monthly review of pregnant patients with thalassaemia was performed until 28 weeks of gestation and fortnightly thereafter. The MDT provided routine as well as specialist antenatal care |  |  |  |
| Pregnant patients with TDT who had cardiac T2\* >20 ms prior to conception had a specialist cardiac assessment early in the third trimester of gestation and further review thereafter as appropriate |  |  |  |
| Thyroid function in pregnant patients with thalassaemia and hypothyroidism was monitored |  |  |  |
| Serum fructosamine in pregnant patients with thalassaemia and diabetes was monitored |  |  |  |
| Daily folic acid (5 mg) was initiated preconceptually to prevent neural tube defects and was continued throughout pregnancy |  |  |  |
| Daily aspirin (75–150 mg) was initiated from 12 weeks |  |  |  |
| An early viability ultrasound scan at 7–9 weeks of gestation was offered |  |  |  |
| Serial fetal growth scans every 4 weeks from 24 weeks of gestation were offered |  |  |  |
| **Transfusion** |
| Ensured asymptomatic patients with non-transfusion-dependent thalassaemia had a clear management plan regarding transfusion in late pregnancy in their obstetric care plan |  |  |  |
| **Thromboprophylaxis** |
| Patients with thalassaemia who were splenectomised OR had a platelet count above 600×109/L were offered LMWH thromboprophylaxis in addition to low-dose aspirin 75–150 mg daily |  |  |  |
| Pregnant patients with thalassaemia received LMWH during hospital admissions |  |  |  |
| **Chelation therapy** |
| Pregnant patients with existing myocardial iron loading received first-trimester specialist cardiology review |  |  |  |
| Women with myocardial iron loading underwent regular cardiology review with careful monitoring of ejection fraction during the pregnancy, as signs of cardiac decompensation are the primary indications for intervention with chelation therapy |  |  |  |
| Patients with no myocardial iron loading were assessed early in the third trimester of gestation to formulate a delivery plan based on cardiology advice |  |  |  |
| Patients presenting with palpitations were assessed for arrhythmias |  |  |  |
| Women at the highest risk of cardiac decompensation (T2\* <10 ms) commenced low-dose subcutaneous DFO (20 mg/kg/day) on a minimum of 4–5 days a week under joint haematology and cardiology guidance from 20 to 24 weeks of gestation |  |  |  |
| **Intrapartum care** |
| The MDT (senior midwife, senior obstetric, anaesthetic and haematology staff) were informed on patient admission to the delivery suite |  |  |  |
| If red cell antibodies were present or haemoglobin <100 g/L, blood was crossmatched on admission. Otherwise, a blood group and save sample were collected |  |  |  |
| Continuous intrapartum electronic fetal heart rate monitoring was performed |  |  |  |
| If the delivery was by caesarean section, was the indication documented in the medical notes  |  |  |  |
| Ensured active management of the third stage of labour to minimise blood loss |  |  |  |
| **Postpartum care** |
| Splenectomised patients received LMWH for 6 weeks after delivery |  |  |  |
| Iron burden at 3 months postpartum was assessed unless myocardial iron overload necessitated earlier assessment |  |  |  |

**Commentary:** |
| Conclusion | (To be completed by the author) |
| Recommend-ations for improvement | Present the result with recommendations, actions and responsibilities for action and a timescale for implementation. Assign a person(s) responsible to do the work within a timeframe. |
| Action plan | (To be completed by the author – see attached action plan proforma) |
| Re-audit date | (To be completed by the author) |
| References | 1. Shah FT, Nicolle S, Garg M, Pancham S, Lieberman G, Anthony K, Mensah AK. Guideline for the management of conception and pregnancy in thalassaemia syndromes: A British Society for Haematology Guideline. *Br J Haematol* 2024;204:2194–2209.
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## Data collection proforma for patients for the management of conception and pregnancy in thalassaemia syndromes

## Audit reviewing practice

Patient name:

Hospital number:

Date of birth:

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| Standard | 1Yes  | 2No | 3 If shaded box not ticked, was there documentation to explain the variance?Yes/No plus free-text comment | 4 Compliant with guideline if shaded box ticked or an appropriate explanation from column 3. Yes/No(Record if standard not applicable) |
| **Assessment and management of patients with hypogonadism needing spermatogenesis induction** |
| **1**Gonadal status was assessed in patients with thalassaemia, commencing at the age of puberty, in conjunction with paediatric endocrinologists |  |  |  |  |
| **2**If gonadotrophin therapy was required for spermatogenesis induction, regular monitoring of response was undertaken, with reduction or increase of dose, or additional therapy added as indicated |  |  |  |  |
| **3**Assisted conception was considered where spermatogenesis was achieved, and natural conception had not occurred by 12 months, or sooner if the female partner was in her mid-30s or older |  |  |  |  |
| **4**Unless microsurgical testicular sperm extraction is/was being considered, gonadotrophin treatment was withdrawn, and testosterone replacement commenced in patients remaining azoospermic after 24 months of combined human chorionic gonadotrophin/human menopausal gonadotrophin treatment |  |  |  |  |
| **Assessment and management of patients with hypogonadism needing ovulation induction** |
| **1**A full fertility workup of both partners was undertaken prior to any ovulation induction therapy |  |  |  |  |
| **2**Patients were fully informed of individualised risk factors both relating to assisted conception, underlying thalassaemia syndrome and any associated complications prior to treatment |  |  |  |  |
| **3**Patients who had failure of treatment or conception after 6 cycles were discussed in an MDT meeting |  |  |  |  |
| **4**Patients did not have a trigger injection if more than 2 follicles of greater than 14 mm were present on the day of trigger without clear and documented counselling |  |  |  |  |
| **Management of pregnant patients** |
| **1**A monthly review of pregnant patients with thalassaemia was performed until 28 weeks of gestation and fortnightly thereafter. The MDT provided routine as well as specialist antenatal care |  |  |  |  |
| **2**Pregnant patients with TDT who had cardiac T2\* >20 ms prior to conception had a specialist cardiac assessment early in the third trimester of gestation and further review thereafter as appropriate |  |  |  |  |
| **3**Thyroid function in pregnant patients with thalassaemia and hypothyroidism was monitored |  |  |  |  |
| **4**Serum fructosamine in pregnant patients with thalassaemia and diabetes was monitored |  |  |  |  |
| **5**Daily folic acid (5 mg) was initiated preconceptually to prevent neural tube defects and was continued throughout pregnancy |  |  |  |  |
| **6**Daily aspirin (75–150 mg) was initiated from 12 weeks |  |  |  |  |
| **7**An early viability ultrasound scan at 7–9 weeks of gestation was offered |  |  |  |  |
| **8**Serial fetal growth scans every 4 weeks from 24 weeks of gestation were offered |  |  |  |  |
| **Transfusion** |
| **1**Ensured asymptomatic patients with non-transfusion-dependent thalassaemia had a clear management plan regarding transfusion in late pregnancy in their obstetric care plan |  |  |  |  |
| **Thromboprophylaxis** |
| **1**Patients with thalassaemia who were splenectomised OR had a platelet count above 600×109/L were offered LMWH thromboprophylaxis in addition to low-dose aspirin 75–150 mg daily |  |  |  |  |
| **2**Pregnant patients with thalassaemia received LMWH during hospital admissions |  |  |  |  |
| **Chelation therapy** |
| **1**Pregnant patients with existing myocardial iron loading received first-trimester specialist cardiology review |  |  |  |  |
| **2**Women with myocardial iron loading underwent regular cardiology review with careful monitoring of ejection fraction during the pregnancy, as signs of cardiac decompensation are the primary indications for intervention with chelation therapy |  |  |  |  |
| **3**Patients with no myocardial iron loading were assessed early in the third trimester of gestation to formulate a delivery plan based on cardiology advice |  |  |  |  |
| **4**Patients presenting with palpitations were assessed for arrhythmias |  |  |  |  |
| **5**Women at the highest risk of cardiac decompensation (T2\* <10 ms) commenced low-dose subcutaneous DFO (20 mg/kg/day) on a minimum of 4–5 days a week under joint haematology and cardiology guidance from 20 to 24 weeks of gestation |  |  |  |  |
| **Intrapartum care** |
| **1**The MDT (senior midwife, senior obstetric, anaesthetic and haematology staff) were informed on patient admission to the delivery suite |  |  |  |  |
| **2**If red cell antibodies were present or haemoglobin <100 g/L, blood was crossmatched on admission. Otherwise, a blood group and save sample were collected |  |  |  |  |
| **3**Continuous intrapartum electronic fetal heart rate monitoring was performed |  |  |  |  |
| **4** Indication for a caesarean section was clearly documented in the notes |  |  |  |  |
| **5**Ensured active management of the third stage of labour to minimise blood loss |  |  |  |  |
| **Postpartum care** |
| **1**Splenectomised patients received LMWH for 6 weeks after delivery |  |  |  |  |
| **2**Iron burden at 3 months postpartum was assessed unless myocardial iron overload necessitated earlier assessment |  |  |  |  |

**List of investigations**

(To be completed by the author)

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|  | **Yes** | **No** |
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| **Audit action plan** An audit of compliance with the BSH guideline for the management of conception and pregnancy in thalassaemia syndromes |
| Audit recommendation | Objective | Action | Timescale | Barriers and constraints | Outcome | Monitoring |
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