CARE PLAN FOR WOMEN IN LABOUR REFUSING A BLOOD TRANSFUSION

(As referred to in the *RCOG News* of the Royal College of Obstetricians & Gynaecologists)

This document is an aid for medical staff and midwives managing a Jehovah's Witness or other patient who declines blood. Autologous procedures such as **blood salvage** and the use of **plasma-derived products** such as clotting agents are a **matter of personal choice for each Witness**. Most will carry an advance decision document expressing their wishes. Please check with the patient.

Risk management

- All Jehovah's Witnesses or those declining a blood transfusion should be seen in a consultant clinic.
- Clinicians should **plan in advance for blood loss.** If the Hb is ≤ 10.5g/dl use **ferrous sulphate 200mg tds and folic acid**–with acidic fruit juice or 100mg ascorbic acid to aid absorption. If unresponsive to oral iron, use **IV iron** which replenishes iron stores faster and more effectively than oral iron[1,2]. A single total-dose IV iron preparation may be more acceptable to the patient than repeat infusions. Addition of **recombinant human erythropoietin** (**EPO)**, which does not cross the placenta and is reportedly safely used in pregnancy, enhances Hb response[3,4].
- High-risk patients should be booked into a unit with **facilities such as interventional radiology, blood salvage and surgical expertise.** All elective surgery must be planned as far ahead as possible.
- For **high-risk caesarean section**, e.g. abnormal placentation, consider with the interventional radiologist elective insertion of catheters for **uterine artery embolisation** immediately pre-operatively and arrange **blood salvage**.
- At the time of labour ensure the **consultant obstetrician and anaesthetist are aware a Jehovah's Witness has been admitted.**
- The **third stage of labour should be actively managed with oxytocics** with consideration of **prophylactic syntocinon** infusion.
- Consider **delayed cord clamping 1-2 min for pre-term infants** to maximise Hb, with controlled cord traction after placental separation[5].
- Check patient's **vital signs and evidence of uterine contraction** every 15 min for 1 to 2 hours after delivery.
- Contact the **Hospital Liaison Committee for Jehovah's Witnesses in an emergency** (contact details on back page).

Management of active haemorrhage

First steps: AVOID DELAY. Involve obstetric, anaesthetic and haematology consultants. Establish IV infusion, along with **uterine massage** (every 10 min for 1 hour can reduce blood loss[6]). **Give oxytocic drugs first, then exclude retained products of conception or trauma** (this could save time). Proceed with **bimanual uterine compression**. Give oxygen. Catheterise and monitor urine output. Consider CVP line. **Slow, but persistent blood loss requires action**. Anticipate coagulation problems. Keep patient fully informed. Proceed with following strategies if bleeding continues:

Oxytocic agents: Ergometrine with **oxytocin (Syntometrine)**: Marginally more effective than oxytocin alone. If patient is hypertensive, use **oxytocin** 10U (not 5U) by slow IV injection (in serious PPH the benefits of higher dose outweigh the risks)[7,8]. **Carboprost (Hemabate)** 250μg/ml IM, can be repeated after 15 min. Direct intra-myometrial injection is faster (less hazardous at open operation).

Misoprostol (Cytotec): Useful option in atonic PPH where first-line treatment has failed. Can be given either by **sub-lingual (**600-800μg), **rectal (**800-1000μg) or **intrauterine route (**800μg)[9,10,11]. Control of haemorrhage reported for rectal and intrauterine routes when unresponsive to oxytocin, ergometrine and carboprost[10 11].

Intrauterine balloon tamponade: Have available purpose-designed 500 ml **Bakri tamponade balloon** (Cookmedical). Drainage of blood and cessation of bleeding can be observed via the catheter drainage shaft. Continue oxytocin. Expulsion of balloon can be prevented by vaginal packing. To minimise bleeding risk during removal, use graduated deflation or slowly deflate to half volume and observe; if no bleeding, continue deflation; if bleeding starts, reinflate[12.13]. Alternatively, stomach balloon of **Sengstaken-Blakemore oesophageal catheter** has controlled haemorrhage in 84% of 43 cases (in 2 studies), in the majority of successful cases bleeding was due to uterine atony[12,14]. Distal end of tube beyond balloon should be cut off to reduce risk of occlusion or perforation. Indwell time of balloon averaged 24 hours[14.] **Bakri balloon also used to control PPH due to vaginal lacerations**[15].

Non-inflatable anti-shock garment: Recently developed neoprene Velcro-fastened garment (zoexniasg.com) can be applied in 2 minutes and allows perineal access for obstetric procedures. Can reduce blood loss and reverse hypovolaemic shock within minutes by the transfer of 0.5 to 1.5 litres of blood from the lower body and abdomen to the vital organs. This can stabilise the patient and gain time while awaiting senior staff input. Successful trials have been conducted with >400 women experiencing PPH in developing countries[16].

Recombinant factor VIIa (NovoSeven): Increasing evidence of effectiveness for control of PPH unresponsive to standard therapies. This product and the following haemostatic agents should be used under consultant guidance. 90 μg/kg provide site-specific thrombin generation, repeat if unresponsive. Successfully used to stop or reduce bleeding in 88% of 118 massive PPH cases[17]. Also to control bleeding in 17 anecdotal PPH cases complicated by DIC[18]. (Novo Nordisk have 24-hour emergency distribution for UK-wide delivery [01889 565652] or a small stock can be held to avoid delivery delay.) Occasional failure of FVIIa has been attributed to a low fibrinogen level[19]. The **fibrinogen concentrate Haemocomplettan** (a plasma-derived **alternative to cryoprecipitate;** available on a named-patient basis within 24 hours from CSL Behring; 01444 447400) can enhance clot strength and normalise clotting in the presence of FVIIa[20,21].

Other haemostatic agents: Prothrombin complex concentrates (PCCs) such as **Beriplex** and **Octaplex** (plasma-derived), are proposed as substitutes for fresh frozen plasma and are widely prescribed as such in Europe. Beriplex reported to achieve control of bleeding in cardiac and other surgery[22]. **Tranexamic acid (Cyklokapron)**: anti-fibrinolytic agent well established for controlling haemorrhage, use 1gm IV x tds, slowly[23]. **Fibrin sealants**: **Flowseal** used to arrest massive bleeding in surgical bed following hysterectomy[24]; **Tisseel** has controlled bleeding of complicated vulval and vaginal lacerations when suture haemostasis failed due to tissue friability[25]. Also consider IV **vitamin K.**

B-Lynch uterine compression suture: The B-Lynch brace suture can also be **combined with intrauterine balloon catheter** if bleeding persists[26]. **Prophylactic insertion of this suture** has been used in high-risk caesarean section[4]. The **Hayman suture technique** may be a simpler procedure and quicker to apply as the lower uterine segment is not opened[27].

Embolisation/ligation of internal iliac arteries or embolisation/bilateral mass ligation of uterine vessels: Angioplasty balloon catheters can be used for emergency temporary occlusion in theatre, with transfer to the angiography suite for definitive embolisation[28].

Hysterectomy and care in theatre: Subtotal hysterectomy can be just as effective, also quicker and safer. Use Flowtrons Excell to decrease risk of DVTs. Avoid hypothermia (impairs coagulation), use fluid warmer, bair hugger, hats etc. Avoid unnecessary over-dilution. Have blood salvage and experienced operator on hand (see below).

Intraoperative blood salvage: Endorsed by NICE (2005) and RCOG (2008) guidelines. Should be set up whenever possible (check if acceptable to the patient). Either single or double suction methods can be used for collection. However, to maximise blood recovery, there is good evidence that single suction is a safe procedure[29]. Swab washing also increases RBC recovery. A 'collect only' set-up of the anticoagulation/suction tubing will enable blood salvage to begin within minutes[30]. Conventionally, a leukocyte filter has been used when reinfusing, though in an emergency situation the filter may be removed completely to maximise the flow rate, as prior to availability of filters no adverse events were reported. These are clinical decisions based on the balance of benefit/risk.

Management of postpartum anaemia—continued on back page

Management of postpartum anaemia

IV iron should be considered for severe anaemia as oral iron is known to be slow and unreliable. In a randomised controlled study of 44 women with postpartum anaemia, significantly higher mean haemoglobin and ferritin levels from baseline were achieved for patients on **IV iron sucrose** (200 mg x 2, 48 hours apart) in comparison to those on oral iron (mean Hb day 5: IV vs oral iron, 2.5 vs 0.7gm/dl - day 14 Hb: 3.8 vs 1.5gm/dl, p = <0.01 for both periods)[31]. Comparable results for IV iron sucrose were reported in 2 similar trials (mean Hb 2.8 & 3.1, both day 14)[32,33]. These increases in Hb from baseline with IV iron exceed the expected rise after a 2U blood transfusion[32]. The level of life-threatening adverse drug events of IV iron preparations is now very low, varying from 0.6 to 3.3 per million, depending on the iron preparation (FDA data)[34].

Erythropoiesis-stimulating agents (ESAs) should be administered **together with IV iron** in life-threatening anaemia to further accelerate erythropoiesis. A **once weekly EPO dosage of 600 IU/kg subcutaneously** (**e.g. 40,000IU for a 66kg patient**) is being increasingly used and found to be satisfactory in critically ill anaemic patients[35,36]. An **EPO dosage of 300 IU/kg x 3 weekly together with IV iron (200mg x 3 weekly)** has also proved efficacious for postpartum anaemia[37]. Augment with **vitamin B-12 and folic acid**.

Check oxygen saturations: Give **100% oxygen** if necessary (no contraindications for 48-72 hrs of use). Use **microsampling techniques** to conserve blood (e.g. HemoCue), as well as **paediatric sample tubes**. If bleeding continues consider reinfusing washed drain fluid.

Hyperbaric oxygen therapy: Option in life-threatening anaemia[38]. (0151 648 8000 [24 hrs] for suitable and available centres.)

References:

1. Al RA, Unlubilgin E, Kandemir O, Yalvac S, Cakir L, Haberal A. Intravenous versus oral iron for treatment of anemia in pregnancy: a randomized trial. *Obstet Gynecol* 2005; 106: 1335-40.
2. al-Momen AK, al-Meshari A, al-Nuaim L, Saddique A, Abotalib Z, Khashogji T, Abbas M Intravenous iron sucrose complex in the treatment of iron deficiency anemia during pregnancy. *Eur J Obstet Gynecol Reprod Biol* 1996; 69: 121-4.
3. Breymann C, Visca E, Huch R, Huch A. Efficacy and safety of intravenously administered iron sucrose with and without adjuvant recombinant human erythropoietin for the treatment of resistant iron-deficiency anemia during pregnancy. *Am J Obstet Gynecol* 2001; 184: 662-667.
4. Kalu E, Wayne C, Croucher C, Findley I, Manyonda I. Triplet pregnancy in a Jehovah's Witness: recombinant human erythropoietin and iron supplementation for minimising the risks of excessive blood loss. *BJOG* 2002; 109: 723-725.
5. McDonald SJ, Middleton P**.** Effect of timing of umbilical cord clamping of term infants on maternal and neonatal outcomes. *Cochrane Database Syst Rev* 2008 Apr 23; (2): CD004074.
6. Hofmeyr GJ, Abdel-Aleem H, Abdel-Aleem MA. Uterine massage for preventing postpartum haemorrhage. *Cochrane Database Syst Rev* 2008 Jul 16; (3): CD006431.
7. Davies GA, Tessier JL, Woodman MC, Lipson A, Hahn PM. Maternal hemodynamics after oxytocin bolus compared with infusion in the third stage of labor: a randomized controlled trial. *Obstet Gynecol* 2005; 105: 294-9.
8. Choy CMY, Lau WC, Tam WH, Yuen PM. A randomised controlled trial of intramuscular syntometrine and intravenous oxytocin in the management of the third stage of labour. *BJOG* 2002; 109: 173-177.
9. Blum J, Winikoff B, Raghavan S, Dabash R, Ramadan MC, Dilbaz B, Dao B, Durocher J et al. Treatment of post-partum haemorrhage with sublingual misoprostol versus oxytocin in women receiving prophylactic oxytocin: a double-blind, randomised, non-inferiority trial. *Lancet* 2010; 375: 217-23.
10. O'Brien P P, El-Refaey H, Gordon A, Geary M, Rodeck CH. Rectally administered misoprostol for the treatment of postpartum hemorrhage unresponsive to oxytocin and ergometrine: a descriptive study. *Obstet Gynecol* 1998; 92: 212-214.
11. Adekanmi OA, Purmessur S, Edwards G, Barrington JW. Intrauterine misoprostol for the treatment of severe recurrent atonic secondary postpartum haemorrhage. *BJOG* 2001; 108: 541-542.
12. Condous GS, Arulkumaran S, Symonds I, Chapman R, Sinha A, Razvi K. The "tamponade test" in the management of massive postpartum hemorrhage. *Obstet Gynecol* 2003; 101: 767-772.
13. Danso D, Reginald PW. Internal Uterine Tamponade. In: A Textbook of Postpartum Haemorrage. Ch 28, p 263-67. Ed Christopher B-Lynch et al. Sapiens Publishing. 2006.
14. Doumouchtsis SK, Papageorghiou AT, Vernier C, Arulkumaran S. Management of postpartum hemorrhage by uterine balloon tamponade: prospective evaluation of effectiveness. *Acta Obstet Gynecol Scand* 2008; 87: 849-55.
15. Yoong W, Ray A, Phillip SA. Balloon tamponade for postpartum vaginal lacerations in a woman refusing blood transfusion. *Int J Gynaecol Obstet* 2009; 106: 261.
16. Miller S, Hamza S, Bray EH, Lester F, Nada K, Gibson R, Fathalla M, Mourad M, Fathy A, Turan JM, Dau KQ, Nasshar I, Elshair I, Hensleigh P. First aid for obstetric haemorrhage: the pilot study of the non-pneumatic anti-shock garment in Egypt. *BJOG* 2006; 113: 424-29.
17. Franchini M, Franchi M, Bergamini V, Salvagno GL, Montagnana M, Lippi G. A critical review on the use of recombinant factor VIIa in life-threatening obstetric postpartum hemorrhage. *Semin Thromb Hemost* 2008; 34: 104-12.
18. Pepas LP, Arif-Adib M, Kadir RA. Factor VIIa in puerperal hemorrhage with disseminated intravascular coagulation. *Obstet Gynecol* 2006; 108: 757-61.
19. Lewis NR, Brunker P, Lemire SJ, Kaufman RM. Failure of recombinant factor VIIa to correct the coagulopathy in a case of severe postpartum hemorrhage. *Transfusion* 2009; 49: 689-95.
20. Weinkove R, Rangarajan S. Fibrinogen concentrate for acquired hypofibrinogenaemic states. *Transfus Med* 2008; 18: 151-57
21. Tanaka KA, Taketomi T, Szlam F, Calatzis A, Levy JH. Improved clot formation by combined administration of activated factor VII (NovoSeven) and fibrinogen (Haemocomplettan P). *Anesth Analg* 2008; 106: 732-8.
22. Bruce D, Nokes TJ. Prothrombin complex concentrate (Beriplex P/N) in severe bleeding: experience in a large tertiary hospital. *Crit Care* 2008; 12: R105.
23. Gai M-y, Wu L-f, Su Q-f, Tatsumoto K. Clinical observation of blood loss reduced by tranexamic acid during and after caesarian section: A multi-center, randomized trial. *Eur J Obstet Gynecol Reprod Biol* 2004; 112: 154-157.
24. Moriarty KT, Premila S, Bulmer PJ. Use of FloSeal haemostatic gel in massive obstetric haemorrhage: a case report. *BJOG* 2008; 115: 793-95.
25. Whiteside JL, Asif RB, Novello RJ. Fibrin Sealant for Management of Complicated Obstetric Lacerations. Case Reports. *Obstet & Gynecol* 2010: 115; 403-404
26. Danso D, Reginald P. Combined B-Lynch suture with intrauterine balloon catheter triumphs over massive postpartum haemorrhage. *BJOG* 2002; 109: 963.
27. Ghezzi F, Cromi A, Uccella S, Raio L, Bolis P, Surbek D. The Hayman technique: a simple method to treat postpartum haemorrhage. *BJOG* 2007; 114: 362-5.
28. Choji K, Shimizu T. Embolization. In: A Textbook of Postpartum Haemorrage. Ch 30, p 277-85. Ed Christopher B-Lynch et al.. Sapiens Publishing. 2006.
29. Sullivan I, Faulds J, Ralph C. Contamination of salvaged maternal blood by amniotic fluid and fetal red cells during elective Caesarean section. *Br J Anaesth* 2008; 101: 225-9.
30. Catling S. Blood conservation techniques in obstetrics: a UK perspective. *Int J Obstet Anesth* 2007; 16: 241-49.
31. Bhandal N, Russell R. Intravenous versus oral iron therapy for postpartum anaemia *BJOG*. 2006; 113: 1248-52.
32. Wågström E, Akesson A, Van Rooijen M, Larson B, Bremme K. Erythropoietin and intravenous iron therapy in postpartum anaemia *Acta Obstet Gynecol Scand* 2007; 86: 957-62.
33. Broche DE, Gay C, Armand-Branger S, Grangeasse L, Terzibachian JJ. Acute postpartum anaemia. Clinical practice and interest of intravenous iron. *Gynécol Obstét Fertil* 2004; 32: 613-19.
34. Chertow GM, Mason PD, Vaage-Nilsen O, Ahlmén J. Update on adverse drug events associated with parenteral iron. *Nephrol Dial Transplant* 2006; 21: 378-82.
35. Corwin HL, Gettinger A, Pearl RG, Fink MP, Levy MM, Shapiro MJ, Corwin MJ, Colton T. Efficacy of recombinant human erythropoietin in critically ill patients: a randomized controlled trial. *JAMA* 2002; 288: 2827-35.
36. Georgopoulos D, Matamis D, Routsi C, Michalopoulos A, Maggina N, Dimopoulos G, et al. Recombinant human erythropoietin therapy in critically ill patients: a dose-response study *Crit Care* 2005; 9: R508-15.
37. Breymann C, Richter C, Hüttner C, Huch R, Huch A. Effectiveness of recombinant erythropoietin and iron sucrose vs. iron therapy only, in patients with postpartum anaemia and blunted erythropoiesis. *Eur J Clin Invest* 2000; 30: 154-161.
38. McLoughlin PL, Cope TM, Harrison JC. Hyperbaric oxygen therapy in the management of severe acute anaemia in a Jehovah's Witness. *Anaesthesia* 1999; 54: 891-895.

This document has been reviewed by consultants in obstetrics, gynaecology, anaesthesia and haematology (including experts in haemostasis). It reflects current clinical and scientific knowledge and is subject to change. The strategies are not intended as an exclusive guide to treatment. Good clinical judgement, taking into account individual circumstances, may require adjustments.

For questions, comments, or information as to the availability of the above medications/treatment options please contact:
Hospital Information Services for Jehovah's Witnesses **(054-433-9541,054-433-9542 (24 hrs); hid.gh@jw.org)**

Jan 2011