

South Central Regional Transfusion Committee

Platelets - Let's stick together!

Platelet guidelines: the good, the bad and the ugly

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1st March 2017

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Guideline



“A **guideline** is a statement by which to determine a course of action.

A guideline aims to streamline particular processes according to a set routine or sound practice.

By definition, following a guideline is never mandatory. Guidelines are not binding and are not enforced.”

Guidelines for Use of Platelet Transfusions

- **Lise J Estcourt, Janet Birchall (Writing Group Chair), Shubha Allard (BCSH Task Force Member), Stephen J Bassey, Peter Hersey, J Paul Kerr, Andrew D Mumford, Simon J Stanworth, Hazel Tinegate on behalf of the British Committee for Standards in Haematology.**

Modified WHO definition of bleeding events

Grade 1

- Mild/moderate petechiae, purpura.
- Mild/moderate oropharyngeal bleeding, epistaxis <30 minutes in duration

Grade 2

- Melaena, haematemesis, haemoptysis, fresh blood in stool, musculoskeletal bleeding or soft tissue bleeding **not requiring red cell transfusion within 24 hours of onset and without haemodynamic instability**
- Profuse epistaxis or oropharyngeal bleeding *i.e.* > 30 minutes in continuous duration
- Symptomatic oral blood blisters *i.e.* bleeding or causing discomfort
- Extensive petechiae, purpura *i.e.* numerous in number and/or positioned on either face or abdomen and/or spreading by comparison to previous assessment
- Visible blood in urine
- Bleeding from invasive sites requiring 2 ≥ changes of dressings in a 24 hr period
- Unexpected vaginal bleeding saturating 2 ≥ pads with blood in a 24hr period
- Red cells in body cavity fluids obvious macroscopically
- Retinal haemorrhage with/without visual impairment

Grade 3

- Melaena, haematemesis, haemoptysis, haematuria -including intermittent gross bleeding without clots, abnormal vaginal bleeding, fresh blood in stool, epistaxis, and oropharyngeal bleeding, bleeding from invasive sites, musculoskeletal bleeding, or soft tissue bleeding **requiring red cell transfusion specifically for support of bleeding within 24 hours of onset and without haemodynamic instability**
- Body cavity fluids reported as grossly bloody in laboratory, nursing, or medical notes
- CNS bleeding noted on CT (computerized tomography) without clinical consequences

Grade 4

- Debilitating bleeding including retinal bleeding with visual impairment*
- Non-fatal CNS bleeding with neurological signs and symptoms
- Bleeding associated with haemodynamic instability (hypotension, >30 mm Hg change in systolic or diastolic HP)
- Fatal bleeding from any source

**visual impairment is defined as a field deficit, and patients with suspected visual impairment require an ophthalmologic consultation*

Indications for use of platelet transfusion in adults

Indication	Transfusion indicated (threshold) /not indicated
Prophylactic use (No bleeding or WHO grade 1) One adult dose required <ul style="list-style-type: none"> - Reversible bone marrow failure (BMF) including allogeneic stem cell transplant - Reversible BMF with autologous stem cell transplant (consider no prophylaxis) - Critical illness - Chronic BMF receiving intensive therapy - Chronic BMF to prevent persistent bleeding of grade ≥ 2 	10 x 10 ⁹ /L 10 x 10 ⁹ /L 10 x 10 ⁹ /L 10 x 10 ⁹ /L Count variable
<ul style="list-style-type: none"> - Chronic stable BMF, abnormal platelet function, platelet consumption/destruction (e.g. DIC, TTP) or immune thrombocytopenia (ITP, HIT, PTP) 	Not indicated
Prophylactic use in the presence of risk factors for bleeding (e.g. sepsis, antibiotic treatment, abnormalities of haemostasis) <ul style="list-style-type: none"> - Reversible/chronic bone marrow failure/critical care 	10 to 20 x 10 ⁹ /L
<ul style="list-style-type: none"> - Abnormal platelet function, platelet consumption/destruction, immune thrombocytopenia 	Not indicated
Platelet transfusion preprocedure <ul style="list-style-type: none"> - Central venous catheter (CVC) excluding PICC line - Lumbar puncture - Percutaneous liver biopsy - Major surgery - Epidural anaesthesia, insertion & removal - Neurosurgery or ophthalmic surgery involving the posterior segment of the eye 	20 x 10 ⁹ /L 40 x 10 ⁹ /L 50 x 10 ⁹ /L 50 x 10 ⁹ /L 80 x 10 ⁹ /L 100 x 10 ⁹ /L
Bone marrow aspirate or trephine biopsies, PICC line insertion, traction removal of central venous catheters (CVCs), cataract surgery	Not indicated
Specific clinical conditions – see below for indications	
Therapeutic use (Bleeding WHO grade 2 or above) <ul style="list-style-type: none"> - Severe bleeding - Multiple trauma, brain or eye injury, spontaneous intracerebral haemorrhage - Bleeding (WHO grade ≥ 2) but not severe 	50 x 10 ⁹ /L 100 x 10 ⁹ /L 30 x 10 ⁹ /L
<ul style="list-style-type: none"> - Bleeding in specific clinical conditions – see below for indications 	
Specific clinical conditions <u>Platelet function defect</u> <ul style="list-style-type: none"> - <i>Congenital</i> – Preprocedure or therapeutic use. When alternative therapy contraindicated or ineffective. Directed by specialist in haemostasis. - <i>Acquired (anti-platelet agents, uraemia)</i>- only indicated for severe bleeding <u>Disseminated intravascular bleeding</u> Preprocedure or therapeutic use. Consider threshold counts above but may not be achievable and individual case review required. <u>Thrombotic thrombocytopenic purpura</u> Platelet transfusion contraindicated unless life-threatening bleeding <u>Immune thrombocytopenia (ITP, HIT, PTP).</u> Pre-procedure when other therapy ineffective/procedure urgent or to treat severe bleeding. Consider threshold counts above but may be unachievable or unnecessary and individual case review required.	Count variable Use preprocedure / therapeutic threshold as guide Count variable Use preprocedure / therapeutic threshold as guide

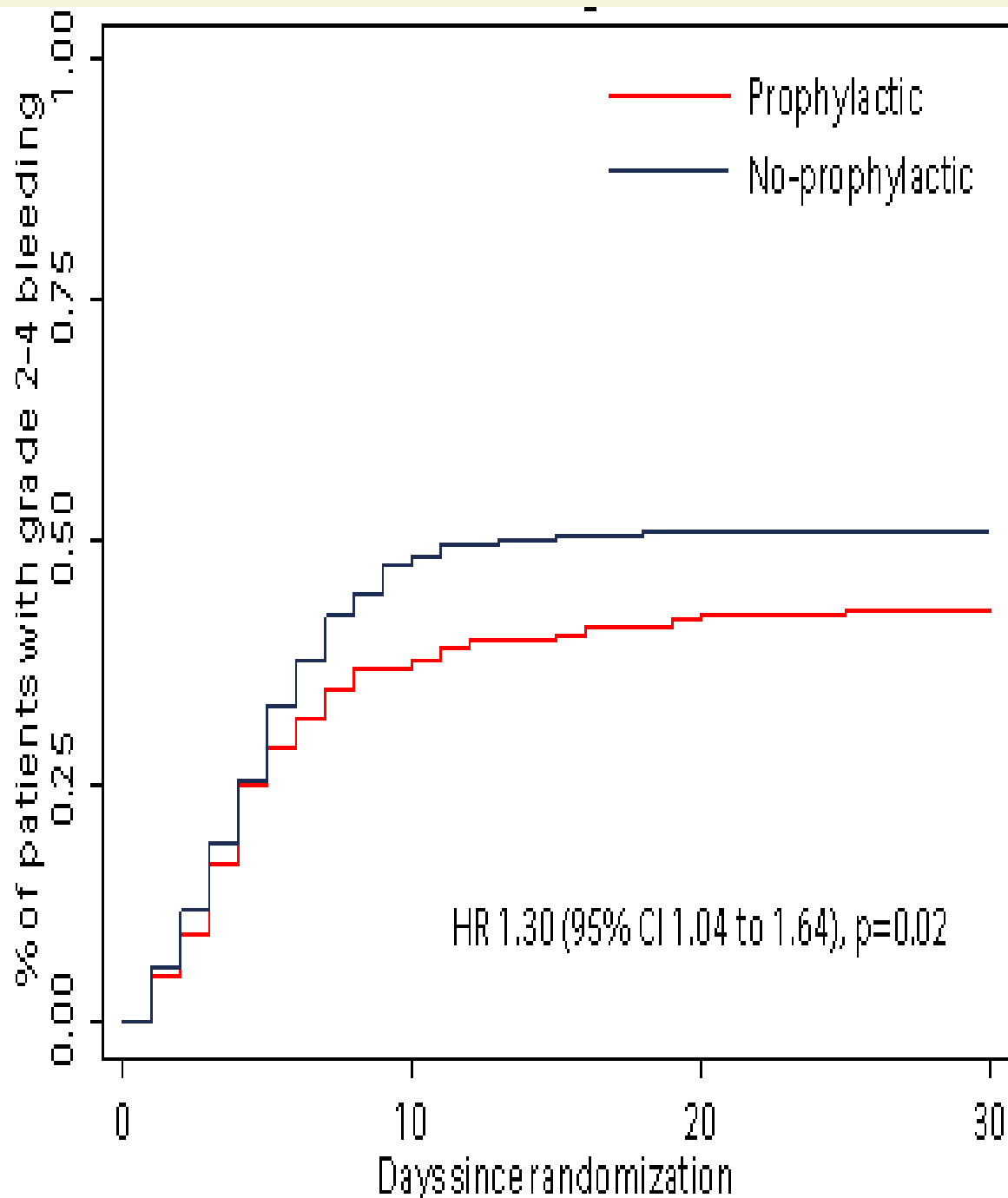
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

MAY 9, 2013

VOL. 368 NO. 19

A No-Prophylaxis Platelet-Transfusion Strategy for Hematologic Cancers



Guidelines for Use of Platelet Transfusions

Table II: Data from (Stanworth et al, 2013a) & (Stanworth et al, 2014)

Patient Group	Difference in proportion of patients who bled (therapeutic versus prophylactic)		No. patients needed to treat prophylactic platelet transfusions to prevent 1 patient from bleeding within 30 day period	
		95% CI		95% CI
All patients	8.4	0.3 to 16.5	12	6 to 333
Autologous stem cell transplant	2.3	-7.2 to 11.9	43	Not estimable as no significant difference between treatment arms
Chemotherapy /allogeneic stem cell transplant	20.0	5.6 to 34.5	5	3 to 18

Guidelines for Use of Platelet Transfusions

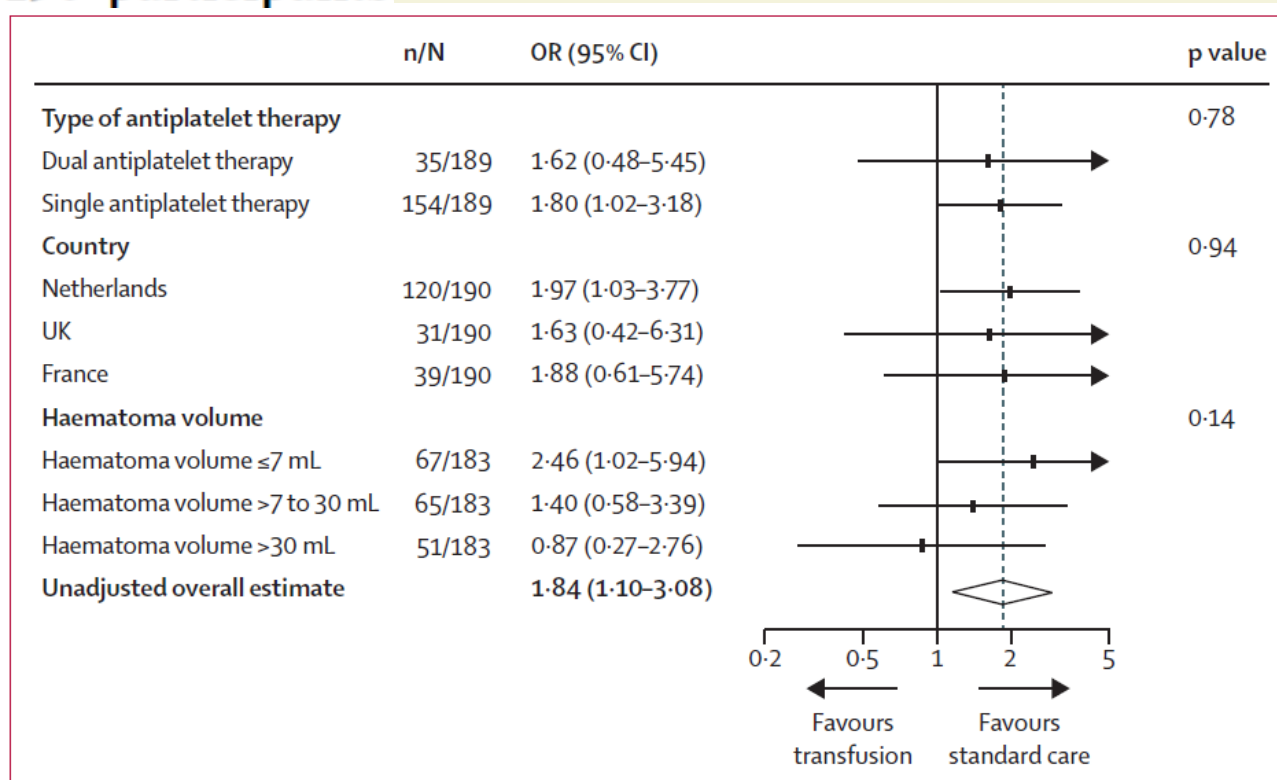
Table VI: Onset of action and half-life of anti-platelet agents

Anti-platelet agent	Onset of action after oral admin	Plasma 1/2-life active drug or metabolite	Time drug admin to ↓ efficacy of platelet tx (active drug >25% peak level)	Time normal platelet function after stopping drug
Abciximab	Not relevant	30 minutes	1 hour	24 to 48 hours
Aspirin	< 1 hour (3 -4 enteric-coated prep)	15 to 20 minutes	2 hours (4 to 5 enteric-coated prep)	5 to 7 days
Clopidogrel	4 - 8 hrs	30 minutes	12 hrs	5 to 7 days
Dipyridamole	1.25 hours	2 to 3 hours	5 to 7 hours	24 hours
Eptifibatide	Not relevant	2.5 hours	4 hours	4 to 8 hours
Ibuprofen	45 minutes to 2 hours	2 hours	6 hours	24 hours
Prasugrel	2 to 4 hours	7 hours	16 to 18 hours	5 to 7 days
Ticagrelor	1.5 hours	8 to 12 hours	18 to 26 hours	3 to 5 days
Tirofiban	Not relevant	1.5 hours	4 hours	4 to 8 hours

Critical bleeding on Anti-platelet Agents

Platelet transfusion versus standard care after acute stroke due to spontaneous cerebral haemorrhage associated with antiplatelet therapy (PATCH): a randomised, open-label, phase 3 trial

multicentre, open-label, masked-endpoint, randomised trial
190 participants



Interpretation of all the available evidence

Platelet transfusion seems inferior to standard care after acute intracerebral haemorrhage in people taking antiplatelet therapy. We cannot recommend platelet transfusion for this indication, pending the results of another similar randomised trial.

www.thelancet.com Published online May 10, 2016

Guidelines for Use of Platelet Transfusions

Risks from Platelet Transfusions

Maximise use of ABO compatible platelets especially to patients who require regular platelet support (2B).

Acceptable to use ABO incompatible platelets to ↓ wastage. Platelets tested & -ve for high titre haemagglutinins and non gp O platelets associated with ↓ risk of haemolysis. Pooled platelets suspended in PAS also expected to ↓ this risk. (1B).

RhD -ve girls/women childbearing potential should receive RhD -ve platelets. If unavailable use RhD +ve with anti-D prophylaxis. (1B).

RhD -ve boys <18 yrs, patients with anti-D & tx-dependant adults, platelets of choice RhD -ve. RhD +ve platelets should be given if RhD -ve unavailable or to prevent wastage of RhD +ve platelets

In patients with history of allergic tx reactions, apart from mild, use platelets suspended in PAS. If reactions continue/severe, washed platelets (resuspended in 100% PAS) may be required (1B).

Platelet concentrates

Dose – for prophylaxis, do not routinely transfuse more than 1 adult therapeutic dose. Prior to invasive procedure or to treat bleeding, consider the size of the patient, previous increments and the target count.

Prophylactic platelet transfusion

P1 Plt $<10 \times 10^9/L$ reversible bone marrow failure

Not indicated in chronic bone marrow failure

P2 Plt $10 - 20 \times 10^9/L$ sepsis / haemostatic abnormality

Prior to invasive procedure or surgery

P3. To prevent bleeding associated with invasive procedures.

Platelets should be transfused if:-

- **P3a Plt $<20 \times 10^9/L$ central venous line**
- **P3b Plt $<40 \times 10^9/L$ pre lumbar puncture/spinal anaesthesia**
- **P3c Plt $<50 \times 10^9/L$ pre liver biopsy / major surgery**
- **P3d Plt $<80 \times 10^9/L$ epidural anaesthesia**
- **P3e Plt $<100 \times 10^9/L$ pre critical site surgery eg CNS**
- **Transfusion prior to bone marrow biopsy is not required.**

Therapeutic use to treat bleeding (WHO bleeding grade 2 or above)

P4a Major haemorrhage Plt $<50 \times 10^9/L$

P4b Critical site bleeding eg CNS / traumatic brain injury Plt $<100 \times 10^9/L$

P4c Clinically significant bleeding Plt $<30 \times 10^9/L$

Specific clinical conditions

P5i DIC pre procedure or if bleeding

P5ii Primary immune thrombocytopenia (emergency treatment pre-procedure / severe bleeding)

P6. Platelet dysfunction

P6a Consider if critical bleeding on anti-platelet medication

P6b Inherited platelet disorders directed by specialist in haemostasis

June 2016

Platelets recommendations

- Offer platelet transfusions to patients with thrombocytopenia who have clinically significant bleeding (World Health Organization [WHO] grade 2) and a platelet count below 30×10^9 per litre.
- Use higher platelet thresholds (up to a maximum of 100×10^9 per litre) for patients with thrombocytopenia and either of the following:
 - severe bleeding (WHO grades 3 and 4)
 - bleeding in critical sites, such as the central nervous system (including eyes).
- Offer prophylactic platelet transfusions to patients with a platelet count below 10×10^9 per litre who are not bleeding or having invasive procedures or surgery, and who do not have any of the following conditions:
 - chronic bone marrow failure
 - autoimmune thrombocytopenia
 - heparin-induced thrombocytopenia
 - thrombotic thrombocytopenic purpura.
- Consider prophylactic platelet transfusions to raise the platelet count above 50×10^9 per litre in patients who are having invasive procedures or surgery.
- Consider a higher threshold (for example $50\text{--}75 \times 10^9$ per litre) for patients with a high risk of bleeding who are having invasive procedures or surgery, after taking into account:
 - the specific procedure the patient is having
 - the cause of the thrombocytopenia
 - whether the patient's platelet count is falling
 - any coexisting causes of abnormal haemostasis.
- Consider prophylactic platelet transfusions to raise the platelet count above 100×10^9 per litre in patients having surgery in critical sites, such as the central nervous system (including the posterior segment of the eyes).
- Do not routinely offer prophylactic platelet transfusions to patients with any of the following:
 - chronic bone marrow failure
 - autoimmune thrombocytopenia
 - heparin-induced thrombocytopenia
 - thrombotic thrombocytopenic purpura.
- Do not offer prophylactic platelet transfusions to patients having procedures with a low risk of bleeding, such as adults having central venous cannulation or any patients having bone marrow aspiration and trephine biopsy.
- Do not routinely transfuse more than a single dose of platelets.
- Only consider giving more than a single dose of platelets in a transfusion for patients with severe thrombocytopenia and bleeding in a critical site, such as the central nervous system (including eyes).
- Reassess the patient's clinical condition and check their platelet count after each platelet transfusion, and give further doses if needed.

NICE



guideline

November 2015

Guidelines for the diagnosis and management of adult aplastic anaemia **2015**

- Prophylactic platelet transfusions should be given to stable AA patients receiving active treatment. Grade 1B. A threshold (pre-transfusion) platelet count of $10 \times 10^9/l$ should be used. Grade 1B
- In patients judged to have additional risk factors for bleeding, such as fever or sepsis, a higher prophylactic transfusion threshold of $20 \times 10^9/l$ is recommended. Grade 2C
- Routine prophylactic platelet transfusions are not recommended for stable AA patients not on active treatment. Grade 2B
- Patients with chronic bleeding of World Health Organization grade 2 or above require individual management according to the severity of their symptoms and signs. Grade 2C
- Prior to administration of antithymocyte globulin (ATG), a daily threshold (pre-transfusion) platelet count of $20 \times 10^9/l$ should be used for the duration of the ATG course. Grade 2C
- Only one adult platelet dose is routinely required. Grade 1A.

Platelet transfusion

- For urgent low bleeding risk surgery in patients on antiplatelet agents routine platelet transfusion should not be given (2C)
- For urgent high-bleeding risk surgery in patients on antiplatelet agents
 - Given the uncertain net benefit of platelet transfusion, consider the use of pre-operative intravenous tranexamic acid (2C)
 - If, despite tranexamic acid, there is excessive peri- or post-op bleeding, or if the bleeding risk is perceived to be very high, consider infusion of 2 pools of donor platelets. This may improve haemostasis if given at least two h after the last dose of aspirin though even higher doses of donor platelets 12–24 h after the last dose of clopidogrel may have a lesser effect (2C)

Guidelines

AAGBI guidelines: the use of blood components and their alternatives 2016

Antiplatelet drugs and non-cardiac surgery in patients with coronary stents

For emergency surgery, management depends on the antiplatelet agent and when the last dose was taken. Platelet transfusion should be reserved as an additional measure for critical bleeding.

Indications for platelets include the following:

If not bleeding, the following triggers should be applied:

- routine prophylactic use: $10 \times 10^9.l^{-1}$;
 - prophylactic use with additional risk factors (e.g. Sepsis): $10 - 20 \times 10^9.l^{-1}$;
 - other major surgery or invasive procedures: $50 \times 10^9.l^{-1}$;
 - neuraxial blockade: $50 \times 10^9.l^{-1}$; and
 - prophylactic use in closed compartment surgery (eye, brain): $100 \times 10^9.l^{-1}$.
- If patient is actively bleeding, transfuse to a platelet count $> 75 \times 10^9.l^{-1}$

What's good about platelet guidelines?

- BSH
 - multidisciplinary
 - amalgamates 198 references
 - Includes ABO advice & alternatives
 - Summary 1 page document
 - Incorporated into NBTC indications with available poster, bookmark, i phone app & classification for audit
- Current BSH AA & Peri-op management of AC & anti-platelet agents, AAGBI blood component guidelines all remarkably consistent

NBTC Indications for Transfusion Poster

Guidance for the use of Blood Components



This guidance is based on the National Blood Transfusion Committee (NBTC) Indication Codes for Transfusion (June 2016)

National Blood Transfusion Committee

The indications for transfusion provided below are taken from national guidelines for the use of blood components in adults (see references). Amalgamation into this summary document aims to act as a prompt for clinicians to facilitate appropriate use and to enable robust documentation of indications. Each indication has been assigned a number, to permit reproducible coding, when requesting blood or for documentation purposes. Specific details regarding the patient's diagnosis and any relevant procedures to be undertaken should also be provided at request either on a written request form, electronic blood order or by telephone when the request is urgent. These are current guidelines and may change depending on new evidence.

Red cell concentrates

Dose – in the absence of active bleeding, use the minimum number of units required to achieve a target Hb. Consider the size of the patient; assume an increment of 10g/L per unit for an average 70kg adult.

R1. Acute bleeding

Acute blood loss with haemodynamic instability.

After normovolaemia has been achieved/maintained, frequent measurement of Hb (including by near patient testing) should be used to guide the use of red cell transfusion – see suggested thresholds below.

R2. Hb ≤ 70g/L stable patient

Acute anaemia. Use an Hb threshold of 70g/L and a target Hb of 70-90g/L to guide red cell transfusion. Follow local/specific protocols for indications such as post cardiac surgery, traumatic brain injury, acute cerebral ischaemia.

R3. Hb ≤ 80g/L if cardiovascular disease

Use an Hb threshold of 80g/L and a target Hb of 80-100g/L.

R4. Chronic transfusion dependent anaemia

Transfuse to maintain an Hb which prevents symptoms. Suggest an Hb threshold of 80g/L initially and adjust as required. Haemoglobinopathy patients require individualised Hb thresholds depending on age and diagnosis.

R5. Radiotherapy maintain Hb ≥ 110g/L

There is limited evidence for maintaining an Hb of 110g/L in patients receiving radiotherapy for cervical and possibly other tumours.

R6. Exchange transfusion

Fresh frozen plasma (FFP)

Dose – 15ml/kg body weight, often equivalent to 4 units in adults.

F1. Major haemorrhage

Early infusion of FFP is recommended in a ratio of 1 unit FFP:1 unit red cells for trauma and at least 1 unit FFP:2 units red cells in other major haemorrhage settings. Once bleeding is under control, FFP use should be guided by timely tests for coagulation as indicated below.

F2. PT Ratio/INR >1.5 with bleeding

Clinically significant bleeding without major haemorrhage. FFP required if coagulopathy. Aim for a PT and APTT ratio of ≤1.5.

F3. PT Ratio/INR >1.5 and pre-procedure

Prophylactic use when coagulation results are abnormal e.g. disseminated intravascular coagulation and invasive procedure is planned with risk of clinically significant bleeding.

F4. Liver disease with PT Ratio/INR >2 and pre-procedure

FFP should not be routinely administered to non-bleeding patients or before invasive procedures when the PT ratio/INR is ≤2.

F5. TTP/plasma exchange

F6. Replacement of single coagulation factor



Prothrombin complex concentrate

Dose should be determined by the situation and INR. Local guidelines should be followed.

PCC1. Emergency reversal of VKA for severe bleeding or head injury with suspected intracerebral haemorrhage.

PCC2. Emergency reversal of VKA pre emergency surgery

Cryoprecipitate

Dose – 2 pooled units, equivalent to 10 individual units, will increase fibrinogen by approximately 1g/L. Cryoprecipitate is usually used with FFP unless there is an isolated deficiency of fibrinogen.

C1. Clinically significant bleeding and fibrinogen <1.5g/L (<2g/L in obstetric bleeding)

C2. Fibrinogen <1g/L and pre procedure

C3. Bleeding associated with thrombolytic therapy

C4. Inherited hypofibrinogenaemia, fibrinogen concentrate not available



Platelet concentrates

Dose – for prophylaxis, do not routinely transfuse more than 1 adult therapeutic dose. Prior to invasive procedure or to treat bleeding, consider the size of the patient, previous increments and the target count.

Prophylactic platelet transfusion

P1. Plt <10 x 10⁹/L reversible bone marrow failure Not indicated in chronic bone marrow failure

P2. Plt 10 – 20 x 10⁹/L sepsis/haemostatic abnormality

Prior to invasive procedure or surgery

P3. To prevent bleeding associated with invasive procedures. Platelets should be transfused if:

- P3a Plt <20 x 10⁹/L central venous line
- P3b Plt <40 x 10⁹/L pre lumbar puncture/spinal anaesthesia
- P3c Plt <50 x 10⁹/L pre liver biopsy/major surgery
- P3d Plt <80 x 10⁹/L epidural anaesthesia
- P3e Plt <100 x 10⁹/L pre critical site surgery e.g. CNS.
- Transfusion prior to bone marrow biopsy is not required.



Therapeutic use to treat bleeding (WHO bleeding grade 2 or above)

P4a Major haemorrhage Plt <50 x 10⁹/L

P4b Critical site bleeding e.g. CNS/traumatic brain injury Plt <100 x 10⁹/L

P4c Clinically significant bleeding Plt <30 x 10⁹/L.

Specific clinical conditions

P5a DIC pre procedure or if bleeding.

P5b Primary immune thrombocytopenia (emergency treatment pre-procedure/severe bleeding).

Platelet dysfunction

P6a Consider if critical bleeding on anti-platelet medication.

P6b Inherited platelet disorders directed by specialist in haemostasis.

References

British Committee for Standards in Haematology (2012). Guidelines on the management of anaemia and red cell transfusion in adult critically ill patients. *British Journal of Haematology*, **160**, 445-46.
British Committee for Standards in Haematology (2015). A practical guideline for the haematological management of major haemorrhage. *British Journal of Haematology*, **170**, 788-803.
British Committee for Standards in Haematology (2016). Draft guidelines for the use of platelet transfusions.
British Society of Gastroenterology (2015). UK guidelines on the management of variceal haemorrhage in cirrhotic patients. *GUT*, **0**, 1-25.

British Society of Gastroenterology. Clinical Services. Care Bundles. British Society of Gastroenterology & British Association for the Study of the Liver Decompensated Cirrhosis Care Bundle – First 24 Hours. www.bsg.org.uk
European Society of Anaesthesiology Guidelines (2013). Management of severe perioperative bleeding. *European Journal of Anaesthesiology*, **30**, 270-382
National Institute for Health and Clinical Excellence (2015). Blood transfusion NG24. nice.org.uk/guidance/ng24
Royal College of Obstetricians & Gynaecologists (2015). Blood Transfusion in Obstetrics. *Green-top Guideline No. 47*.

Further information on blood transfusion will be available on hospital intranet sites or from the blood transfusion laboratory.

Platelet concentrates

Dose – for prophylaxis, do not routinely transfuse more than 1 adult therapeutic dose. Prior to invasive procedure or to treat bleeding, consider the size of the patient, previous increments and the target count.

Prophylactic platelet transfusion

- P1.** Plt $<10 \times 10^9/L$ reversible bone marrow failure
Not indicated in chronic bone marrow failure
- P2.** Plt $10 - 20 \times 10^9/L$ sepsis/haemostatic abnormality

Prior to invasive procedure or surgery

- P3.** To prevent bleeding associated with invasive procedures.
Platelets should be transfused if:
 - **P3a** Plt $<20 \times 10^9/L$ central venous line
 - **P3b** Plt $<40 \times 10^9/L$ pre lumbar puncture/spinal anaesthesia
 - **P3c** Plt $<50 \times 10^9/L$ pre liver biopsy/major surgery
 - **P3d** Plt $<80 \times 10^9/L$ epidural anaesthesia
 - **P3e** Plt $<100 \times 10^9/L$ pre critical site surgery e.g. CNS.
 - Transfusion prior to bone marrow biopsy is not required.

Therapeutic use to treat bleeding (WHO bleeding grade 2 or above)

- P4a** Major haemorrhage Plt $<50 \times 10^9/L$
- P4b** Critical site bleeding e.g. CNS/traumatic brain injury Plt $<100 \times 10^9/L$
- P4c** Clinically significant bleeding Plt $<30 \times 10^9/L$.

Specific clinical conditions

- P5a** DIC pre procedure or if bleeding.
- P5b** Primary immune thrombocytopenia (emergency treatment pre-procedure/severe bleeding).

Platelet dysfunction

- P6a** Consider if critical bleeding on anti-platelet medication.
- P6b** Inherited platelet disorders directed by specialist in haemostasis.



Bookmark

Indications for the use of Blood Components in Adults

This guidance is based on the NBTC Indication Codes for Transfusion (June 2016).

Red cell concentrates

Dose – if no bleeding and anaemia reversible, use the minimum number of units to achieve a target Hb. Assume an increment of 10g/L per unit for a 70kg adult.

- **R1 Acute Bleeding** Once normovolaemia achieved, frequent measurement of Hb (including by near patient testing) should be used – see suggested thresholds below.
- **R2 Hb $\leq 70\text{g/L}$** if stable acute anaemia. Use a target Hb of 70-90g/L. Follow local protocols for post cardiac surgery, traumatic brain injury, acute cerebral ischaemia.
- **R3 Hb $\leq 80\text{g/L}$ if cardiovascular disease** Use a target Hb of 80-100g/L.
- **R4 Chronic transfusion dependent anaemia** Maintain an Hb which prevents symptoms. Suggest an initial threshold of 80g/L then adjust as required. Haemoglobinopathy patients require individualised Hb thresholds.
- **R5 Radiotherapy** Limited data for maintaining Hb of 110g/L.
- **R6 Exchange transfusion.**

Fresh frozen plasma

Dose – 15ml/kg body weight, often equivalent to 4 units.

- **F1 Major haemorrhage** Early use in trauma – 1 unit FFP: 1 unit red cells. Other settings at least 1 unit FFP: 2 units red cells. Once bleeding controlled use thresholds below.
- **F2 PT Ratio/INR >1.5 with bleeding** without major haemorrhage. Keep PT/APTT ratio of <1.5 .
- **F3 PT Ratio/INR >1.5 and pre-procedure** e.g. disseminated intravascular coagulation (DIC) with risk of significant bleeding.
- **F4 Liver disease with PT Ratio/INR >2 and pre-procedure** Not usually required if no bleeding or before invasive procedure if PT ratio/INR is <2 .
- **F5 TTP/plasma exchange.**
- **F6 Replacement of single coagulation factor.**

Prothrombin complex concentrate

Dose determined by situation and INR. Follow local guidelines.

- **PCC1 Emergency reversal of VKA for severe bleeding** or head injury with suspected intracerebral haemorrhage.
- **PCC2 Emergency reversal of VKA pre emergency surgery.**

Reference:

National Blood Transfusion Committee Indication Codes

<http://www.transfusionguidelines.org.uk/uk-transfusion-committees/national-blood-transfusion-committee/responses-and-recommendations>

Cryoprecipitate

Dose – 2 pooled units will increase fibrinogen by approximately 1g/L. Cryoprecipitate is usually used with FFP unless there is an isolated fibrinogen deficiency.

- **C1 Clinically significant bleeding and fibrinogen $<1.5\text{g/L}$** ($<2\text{g/L}$ in obstetric bleeding).
- **C2 Fibrinogen $<1\text{g/L}$ and pre procedure.**
- **C3 Bleeding associated with thrombolytic therapy.**
- **C4 Inherited hypofibrinogenaemia, fibrinogen concentrate not available.**

Platelet concentrates

Dose – for prophylaxis, 1 adult therapeutic dose. Prior to invasive procedure/to treat bleeding, consider patient size, previous increments and target count.

Prophylactic platelet transfusion

- **P1 Plt $<10 \times 10^9/\text{L}$ reversible bone marrow failure.** Not indicated in chronic bone marrow failure.
- **P2 Plt $10 - 20 \times 10^9/\text{L}$ sepsis/haemostatic abnormality.**

Prior to invasive procedure or surgery if:

- **P3a Plt $<20 \times 10^9/\text{L}$ central venous line.**
- **P3b Plt $<40 \times 10^9/\text{L}$ pre lumbar puncture/spinal anaesthesia.**
- **P3c Plt $<50 \times 10^9/\text{L}$ pre liver biopsy/major surgery.**
- **P3d Plt $<80 \times 10^9/\text{L}$ epidural anaesthesia.**
- **P3e Plt $<100 \times 10^9/\text{L}$ pre critical site surgery e.g. CNS.**
- **Transfusion prior to bone marrow biopsy not required.**

Therapeutic use to treat bleeding (WHO bleeding grade ≥ 2)

- **P4a Major haemorrhage Plt $<50 \times 10^9/\text{L}$.**
- **P4b Critical site bleeding e.g. CNS Plt $<100 \times 10^9/\text{L}$.**
- **P4c Clinically significant bleeding Plt $<30 \times 10^9/\text{L}$.**

Specific clinical conditions

- **P5a DIC pre procedure or if bleeding.**
- **P5b Primary immune thrombocytopenia (emergency pre-procedure/severe bleeding).**

Platelet dysfunction

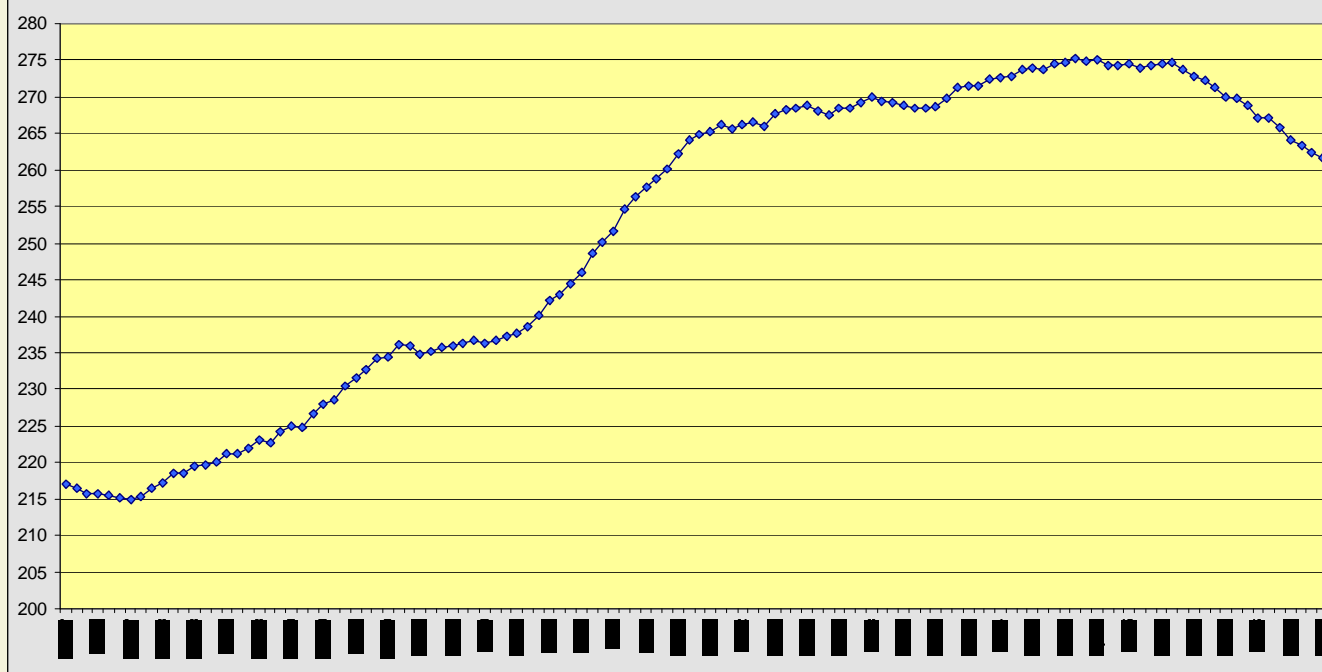
- **P6a Consider if critical bleeding on anti-platelet agent.**
- **P6b Inherited platelet disorders directed by haemostasis specialist.**

Further information will be available on hospital intranet sites or from the blood transfusion laboratory.

Further supplies of this bookmark can be ordered by accessing <https://hospital.nhsbtleaflets.co.uk>

NHSBT platelet issues 2007 - 2016

Moving Annual Total of Platelet Issues to Hospitals - 000s



LoPAG Platelet Champions Day

Sponsored by Cerus

NHS Blood and Transplant, NHSBT Tooting.
Wednesday 23rd November 2016





What's bad about platelet guidelines?

- BSH AA & Peri-op management of AC & anti-platelet agents, AAGBI blood component guidelines still contain differences!
- Many grades 2C



What's ugly about platelet guidelines?

“When ever possible”

Summary

BSH platelet use guidelines

- processed evidence to define best practice so you don't have to
- Comprehensive
- Summary documents easily accessible
- Influence practice