National Blood Transfusion Committee

INDICATION CODES FOR TRANSFUSION IN ADULTS – A SUMMARY OF PUBLISHED RECOMMENDATIONS
2024 Update

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.

These are guidelines and not rules and every transfusion decision must follow an individualised patient assessment. The following principles are fundamental:

- Apply clinical judgement in each scenario, considering the patient's comorbidities and their risk of harm from anaemia versus risks of transfusion
- Do not base transfusion decisions on a haemoglobin value alone
- Consider the haemoglobin trend (both direction and rate of change)
- Address all reversible causes of anaemia (e.g. haematinic deficiency)

Each indication has been assigned a number, to permit reproducible coding when requesting blood or for documentation/ audit purposes.

These are based on current guidelines and may change depending on new evidence. The last evidence review was in January 2024.

Quick reference summary

Red cell concentrates	
R1	Acute bleeding
R2	Acute anaemia (e.g. following bleeding/ surgery/ critical illness) – haemodynamically stable patient and Hb ≤ 70 g/l
R3	Anaemia – haemodynamically stable patient with acute coronary syndrome (excluding stable ischaemic heart disease) and Hb ≤ 80 g/l
R4 R4a R4b	Chronic transfusion-dependent anaemia • Chronic bone marrow failure • Haemoglobinopathies
R5	Radiotherapy and Hb ≤ 100 g/l
R6	Exchange transfusion
R7	Severe chronic anaemia: non-transfusion dependent (e.g. haematinic deficiency, anaemia of chronic disorder)
Fresh frozen plasma	
F1	Major haemorrhage
F2	Bleeding (excluding chronic liver disease) with PT Ratio / INR > 1.5
F3	Pre-procedure (excluding chronic liver disease) with PT Ratio / INR > 1.5
F5	Plasma exchange
F6	Replacement of single coagulation factor
Cryoprecipitate	
C1	Clinically significant bleeding and fibrinogen < 1.5 g/l (< 2.0 g/l in obstetric bleeding)

C2	Pre-procedure with a risk of bleeding and fibrinogen < 1.0 g/l
C3	Bleeding associated with thrombolytic therapy
C4	Inherited hypofibrinogenaemia - fibrinogen concentrate not available
Platelet concentrates	
P1	Reversible bone marrow failure and Plt < 10 x 10^9/l
P2	Sepsis / haemostatic abnormality, or other additional risk factor for bleeding and Plt < 10-20 x 10^9/l
P3 P3a P3b P3c P3d P3e	To prevent bleeding associated with invasive procedures Plt < 20 x 10^9/l - central venous line Plt < 40 x 10^9/l - lumbar puncture/spinal anaesthesia Plt < 50 x 10^9/l - percutaneous liver biopsy / major surgery Plt < 80 x 10^9/l - epidural anaesthesia Plt < 100 x 10^9/l - critical site surgery e.g. central nervous system / eye
P4 P4a P4c P4d	To treat bleeding (WHO bleeding grade 2 or above) • Major haemorrhage – *maintain* Plt > 50 x 10^9/l • Critical site bleeding e.g. CNS – *maintain* Plt > 100 x 10^9/l • Clinically significant bleeding and Plt < 30 x 10^9/l
P5	Consumptive thrombocytopenia with bleeding or pre-procedure (see text)
P6 P6a P6b	Platelet dysfunction • Critical bleeding on anti-platelet medication • Inherited platelet disorders

Explanatory notes

Red cell concentrates

Dose: in non-bleeding patients 4 ml/kg raises haemoglobin concentration by approximately 10 g/l.[1] Use the minimum number of units (or weight-adjusted volume) to achieve the clinical target. This is especially important for patients who are at risk of transfusion-associated circulatory overload (TACO), have low body weight or have severe chronic anaemia. The average volume of an adult unit is 290 ml.

R1 Acute bleeding[2,3,4]

Acute blood loss with haemodynamic instability. After normovolaemia has been achieved/maintained, frequent measurement of haemoglobin (including by near patient testing) should be used to guide the use of red cell transfusion – apply thresholds below.

R2 Acute anaemia (e.g. following bleeding/ surgery/ critical illness) – haemodynamically stable patient and Hb ≤ 70 g/l[5,6]

Consider a haemoglobin threshold of 70 g/l and a target haemoglobin of 70-90 g/l to guide red cell transfusion.

R3 Anaemia – haemodynamically stable patient with acute coronary syndrome (excluding stable ischaemic heart disease) and Hb ≤ 80 g/l[5,6,7]

Consider a haemoglobin threshold of 80 g/l and a target haemoglobin of 80-100 g/l. Caution giving multiple units in patients with chronic anaemia (see R7). A higher haemoglobin target might be considered where there is ongoing myocardial ischaemia, balanced against risk of exacerbating heart failure.

R4 Chronic transfusion-dependent anaemia[5,8,9]

- **R4a** Chronic bone marrow failure - transfuse to maintain a haemoglobin which prevents symptoms. Suggest a haemoglobin threshold of 80 g/l initially and adjust as required. A patient's individualised threshold should be documented once established.

- **R4b** Haemoglobinopathy patients – transfuse to achieve disease control (under direction of a haemoglobinopathy consultant).

R5 Radiotherapy - maintain Hb ≥ 100 g/l[10]
Some observational data suggest patients receiving radiotherapy for cervical tumours had better outcomes if haemoglobin was higher (whether spontaneous or maintained by transfusion). No randomized controlled trial evidence of a benefit. Threshold based on previous NBTC expert consensus, in the absence of published evidence-based guidelines.

R6 Exchange transfusion[9]

R7 Severe chronic anaemia: non-transfusion-dependent (e.g. haematinic deficiency, anaemia of chronic disorder)[11,12,13]
No universal transfusion trigger or target; physiological compensation means transfusion is unlikely to be required if haemoglobin > 70 g/l and most patients with lower haemoglobins will not need transfusion. Transfuse a single unit if necessary to prevent acute complications of severe anaemia while the underlying cause is investigated and treated.

Fresh frozen plasma[14]
Dose – 15-20 ml/kg body weight, often equivalent to 4 units in adults.

F1 Major haemorrhage
In the trauma setting transfuse empirically in a 1:1 ratio with red cells. Other settings give FFP in at least a 1:2 unit ratio with red cells until results from coagulation monitoring are available. Once bleeding is controlled, further FFP should be guided by abnormalities in PT and APTT (keep PT/APTT ratio of < 1.5 x mean normal), or by the use of viscoelastic haemostatic assays in a near-patient setting.

F2 Bleeding (excluding chronic liver disease) with PT Ratio / INR > 1.5
Clinically significant bleeding without major haemorrhage. FFP required only if coagulopathy not due to chronic liver disease. Aim for a PT and APTT ratio of ≤ 1.5, or local protocol range for near-patient viscoelastic assays.

F3 Pre-procedure (excluding chronic liver disease) with PT Ratio / INR > 1.5
Prophylactic use when coagulation results are abnormal e.g. disseminated intravascular coagulation (DIC) and invasive procedure is planned.

F4 Historical indication; no longer recommended to transfuse FFP in chronic liver disease[15,16]

F5 Plasma exchange[17]
Plasma exchange for TTP or where there is a need to replace clotting factors (in other plasmapheresis procedures, albumin would be the standard replacement fluid). Use pooled solvent-detergent treated plasma for TTP.

F6 Replacement of single coagulation factor
Where no factor concentrate is available, under direction of a haemostasis consultant. Usually limited to factor V deficiency. Use pooled solvent-detergent treated plasma.

Cryoprecipitate[14]
Dose – 2 pooled units will increase fibrinogen by approximately 1.0 g/l in an average-sized adult.

C1 Clinically significant bleeding and fibrinogen < 1.5 g/l (< 2.0 g/l in obstetric bleeding)[18]

C2 Pre-procedure with a risk of bleeding and fibrinogen < 1.0 g/l

In chronic liver disease it is uncertain whether fibrinogen levels are causally associated with bleeding risk. Some guidelines recommend a threshold fibrinogen of < 1.2 g/l in this setting[16]; others discourage routine correction of fibrinogen deficiency[15].

C3 Bleeding associated with thrombolytic therapy

C4 Inherited hypofibrinogenaemia - fibrinogen concentrate not available
Under direction of a haemostasis consultant.

Platelet concentrates[19]

Dose – for prophylaxis, do not routinely transfuse more unit. Prior to invasive procedures or to treat bleeding, consider the size of the patient, previous increments and the target count. 1 unit is expected to increase the platelet count by 20-40 x 10^9/l in a transfusion-naïve patient.[20]

Prophylactic platelet transfusion
Platelet count below the following thresholds:
P1 Reversible bone marrow failure and Plt < 10 x 10^9/l
Routine transfusion is not indicated in chronic bone marrow failure if not on intensive treatment and not bleeding.

P2 Sepsis / haemostatic abnormality, or other additional risk factor for bleeding and Plt < 10-20 x 10^9/l

P3 To prevent bleeding associated with invasive procedures

- **P3a Plt < 20 x 10^9/l - central venous line**
- **P3b Plt < 40 x 10^9/l - lumbar puncture/spinal anaesthesia**
- **P3c Plt < 50 x 10^9/l - percutaneous liver biopsy / major surgery**
- **P3d Plt < 80 x 10^9/l - epidural anaesthesia**
- **P3e Plt < 100 x 10^9/l - critical site surgery e.g. central nervous system / eye**

Transfusion is not required prior to bone marrow biopsy or peripherally inserted central catheter (PICC) placement.

Therapeutic platelet transfusion

P4 To treat bleeding (WHO bleeding grade 2 or above)

- **P4a Major haemorrhage – *maintain* Plt > 50 x 10^9/l**

May involve commencing transfusion at a higher platelet count
May be given empirically as part of a major haemorrhage pack/ protocol

- **P4c Critical site bleeding e.g. CNS – *maintain* Plt > 100 x 10^9/l**
- **P4d Clinically significant bleeding and Plt < 30 x 10^9/l**

Specific clinical conditions
P5 Consumptive thrombocytopenia with bleeding or pre-procedure
E.g. DIC or immune thrombocytopenia. Thresholds as above but it may not be feasible to attain a specific platelet target and targets should be defined clinically.
Platelet transfusion is contraindicated in thrombotic thrombocytopenic purpura (TTP).

Platelet dysfunction
P6a Critical bleeding on anti-platelet medication
Consider platelet transfusion guided by the antiplatelet agent, the dose and the timing of last administration. Platelets are considered contraindicated for patients on antiplatelet

agents who develop spontaneous intracranial haemorrhage and are not having surgical intervention.[21]

P6b Inherited platelet disorders

Under the direction of a consultant in haemostasis. HLA matched platelets should be given where time allows.

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