Platelet Transfusion in Non-Haematology Patients

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Monday 17th March 2014

STR Study Day

Key Questions for This Session

1. What is the risk of transfusing unexpectedly thrombocytopenic patients?
2. How should you cover surgery or invasive procedures
   a. In patient who are thrombocytopenic?
   b. In patients on antiplatelet drugs?
3. Supporting critically ill patients
   a. With major bleeding
   b. With DIC
   c. With sepsis

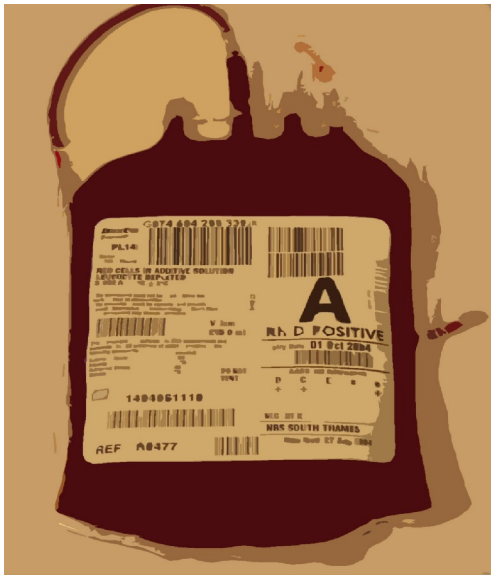
Right Patient

Right Blood

Right Time

Right Reason

PBM: Is a multidisciplinary, evidence-based approach to optimising the care of patients who might need blood transfusion



"Clinically relevant, patient-centred endpoints"

PBM includes: consent, alternatives, pre-op optimisation (Hb, coagulation, platelet function), intraoperative cell salvage and point of care testing

Platelet requests are often referred to a haematologist BUT

- A national audit of platelets in haematology showed 25% of platelets were given inappropriately and 12% of cases were given double dose platelets

THIS MEANS

- Some haematologists don't follow their own rules
- These haematologists are giving (incorrect?) advice to other doctors

How can a haematologist help?

- They can give clinical advice and formulate an treatment plan with the doctor looking after the patient
  - **NO PLATELETS, FEWER/ MORE UNITS, DIFFERENT TIME, OTHER TREATMENT**
- They can get clinical information which makes the decision to transfuse ‘appropriate’

Code	Indication	Trigger (and target)
P1	Prophylaxis in reversible BMF	10 $x10^9$/L
P2	Prophylaxis in BMF with risk factors	20 $x10^9$/L
P3	Prophylaxis with invasive procedures	50 $x10^9$/L Most surgery procedures 80 $x10^9$/L Epidural 100 $x10^9$/L Brain and eyes
P4	Massive blood transfusion (give foundation formula initially)	75 $x10^9$/L 100 $x10^9$/L Multiple trauma esp. brain and eyes
P5	Acquired platelet dysfunction	Aspirin, clopidogrel, cardiac bypass
P6	Acute DIC if bleeding	20-50 $x10^9$/L
P7	Inherited platelet dysfunction	Glanzmann's
P8	Primary ITP	70 $x10^9$/L for surgery 80 $x10^9$/L for epidural
P9	Post Transfusion Purpura (PTP)	In major haemorrhage
P10	NAIT and bleeding	30 $x10^9$/L

Transfusion ‘Triggers’ or ‘Thresholds’

These terms are used to decide if transfusion is ***appropriate*** at a certain platelet count

- The NBTC indication codes are based on trigger/threshold levels
- But they also take into account ***patient factors*** and the ***reason*** for transfusion

Restricting the use of PLATELETS

- Appropriate indication and reason
- Appropriate trigger and target
- Single unit transfusion
  - Give one unit and repeat PLATELET COUNT with clinical review

INTERACTIVE CASES

Where do you think most platelets are transfused?

A. Trauma patients with major haemorrhage
B. Upper GI bleeding
C. Prophylaxis in bone marrow failure
D. Cardiac and vascular surgery

In which situations would platelet transfusion be contraindicated or ineffective? Multiple answers permitted

A. Acute leukaemia
B. HITS
C. Acute ITP
D. TTP
E. PTP
F. NAIT
G. DIC with bleeding

Unexpected Thrombocytopenia

- What is the risk of transfusing a thrombocytopenic patient if you don't know the cause?
- What rules would you make for your transfusion laboratory?

Platelets can be provided by the transfusion laboratory

Platelets can't be provided until a haematologist has reviewed

CASE 1: A transfusion dependent MDS patient aged 80 is scheduled for THR surgery in 2 weeks. Platelet count today is 79 x10^9/L. What would you advise?

A. Give one platelet unit before surgery and have another unit 'standing by'
B. Don't give any before surgery but have 1 platelet unit 'standing by'
C. Platelet transfusion won't be necessary at this level
D. She is not able to have surgery because the platelet count will never be normal

Prophylaxis for S dures

EVIDENCE?
EXPERT OPINION
CLINICAL EXPERIENCE

Platelet count >50x10^9/L for

- Most surgery including cardiopulmonary bypass
- Central line
- Lumbar puncture
- Spinal anaesthetic
- GI endoscopy with biopsy
- Liver, renal and endobronchial biopsy
- Dental extractions

Higher platelet threshold?
>80 x10^9/L for epidural
>100 x10^9/L for neurosurgery or posterior eye surgery
>100 x10^9/L for multiple trauma

If p… x10^9/L

1. Confirm genuine low platelet count (repeat, film)
2. Confirm cause of thrombocytopenia because platelet transfusion may not work
3. Give 1 ATD and repeat count after 10 minutes.
    1. If above threshold - proceed
    2. If not – repeat IATD - recheck
4. Plan if additional platelets needed to maintain count post surgery

Why do people over-order or over-transfuse platelets?

Over-order	Over-transfuse
• Short shelf-life • Named patient component • Not (always) kept in stock • Long delivery time • Delay negotiating with haematologist • Don't have to pay for/explain the wastage (£240)	• Their experience is that the platelet count is not normalised by one ATD • Do not understand (or believe) that a given target is sufficient to stop or prevent bleeding • They have to cope with the bleeding – you don't! (not directly, anyway)

Case 2: A patient on aspirin and clopidogrel for a drug-eluting coronary stent inserted 10 months ago has a elective cholecytectomy planned. What would you advise?

A. Stop aspirin and clopidogrel 3-5 days pre-op and don't provide platelet cover
B. Continue aspirin and clopidogrel and cover the procedure with 1-2 units of platelets
C. Cancel the surgery until 12 months after the stent was inserted
D. Check a PFA and decide on the need for prophylactic platelets based on the result

Features	Aspirin	Clopidogrel	Abciximab	Dipyridamole
Onset of action	Minutes	<24 hours	Immediate	Slow
Half-life	0.5 hours	7-8 hours	Plasma – 30’ Receptor - days	13.5 hours
Bleeding risk	+	+++	+++	+
Platelets for neurosurgery or ICH	One ATD	Two ATD	One ATD	One ATD

Aspirin

- 10% of platelets are made by the marrow every day
- If off aspirin for 2 days should have $50x10^9/L$ of non-aspirinised platelets
- Could do PFA testing as 20-30% of patients are not affected by low dose aspirin
- Only give platelet cover for neurosurgery
- NSAIDs – stop 36-12 hours pre-op

Clopidogrel

- This drug causes the biggest risk of bleeding of all APAs
- Should stop 5 days before if you can
- Still worth checking PFA as 20-30% of patients do not respond to clopidogrel
- Platelet cover is appropriate to prevent bleeding for essential surgery (1ATD usually but 2 ATD for neurosurgery)

Case 3: A patient on ITU with sepsis and renal failure needs all her lines changing today. Platelets are 25 $x10^9/L$. What would you advise the ITU consultant?

A. Platelet transfusion is not indicated unless the patient is bleeding
B. Platelet transfusion is not safe because the cause of the thrombocytopenia is unknown
C. Go ahead with a platelet transfusion and no need to check the increment
D. Give one unit of platelets and check the count then proceed if >50 $x10^9/L$

Case 4: A patient on Rivaroxaban for atrial fibrillation is admitted collapsed with an upper GI bleed. She may have sustained a head injury when she fell. What blood tests would you advise the admitting team to do?

A. A group and save, blood count, clotting screen and renal function tests as a baseline and then repeat periodically
B. None, you advise them to activate the major haemorrhage protocol so no tests are needed
C. A group and screen, blood count and renal function. Clotting tests will be normal on this drug.

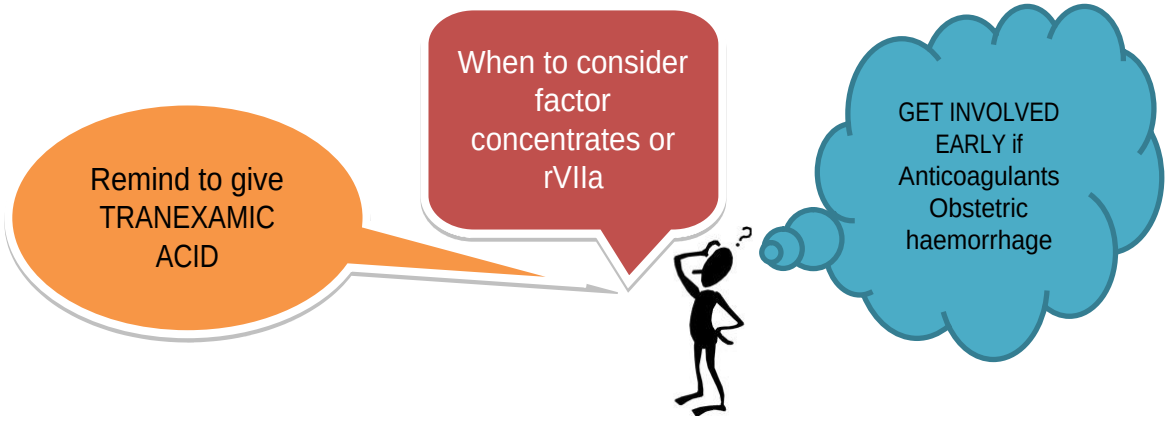
Case 4 : After one hour she continues to bleed and has received 18 units of red cells, 12 units of FFP and 3 units of platelets. She is too unstable to arrange a CT head scan. What would you advise to stop her bleeding?

A. Continue transfusion the same MHP foundation ratio of 6 RBCs:4 FFP:1 Platelets
B. Transfuse according to the blood test results to maintain platelets >100 $x10^9$/L, INR/APTR <1.5 and fibrinogen >1.5g/L
C. Use NovoSeven and/or PCC to reverse the rivaroxaban
D. She will need dialysis to remove the rivaroxaban, nothing else is effective.

When should haematology doctors get involved with massive blood loss?

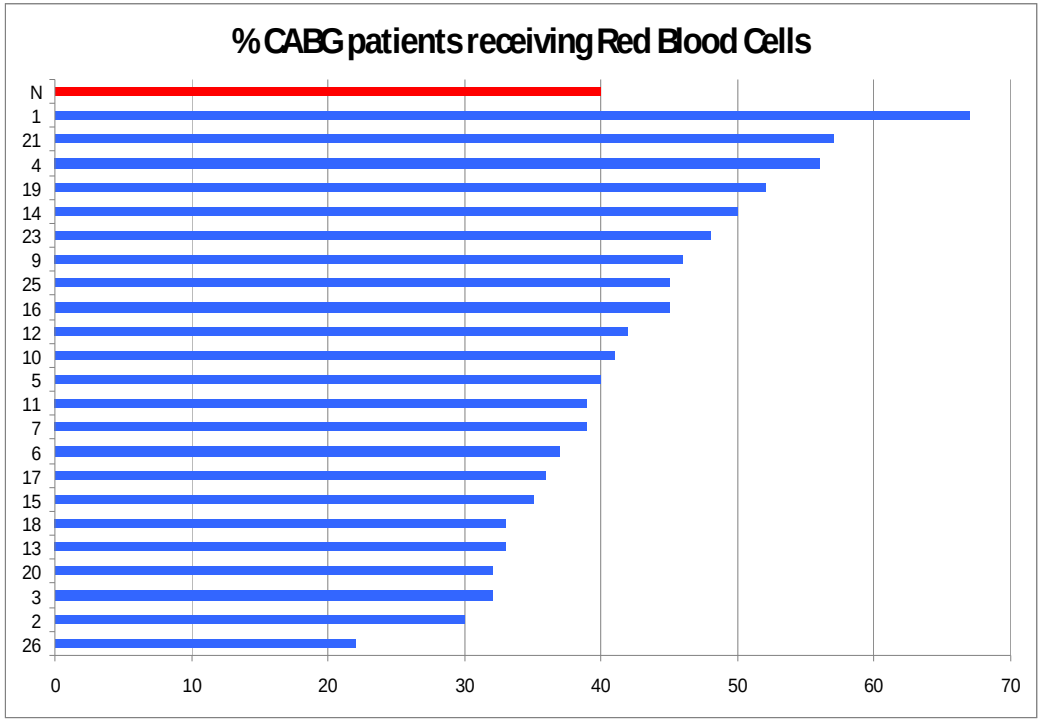
Platelets >75x10^9/L	One unit for every 6 units RBC
INR/APTR <1.5	Four units for every 6 units RBC
Fibrinogen >1.5g/L	2 pools to maintain level

- All hospitals are required to have a major haemorrhage/massive blood loss protocol to issue of blood and FFP before the results of blood tests are available and without the authorisation of haematology medical staff
- The Canadian Consensus Conference on massive blood loss recommends this approach initially but once blood count and coagulation test results are available they should guide further management



Case 5: Your cardiac surgeons participate in a national comparative audit of blood and blood components use and are above average for blood usage for the top 3 common procedures they carry out. What would you do next?

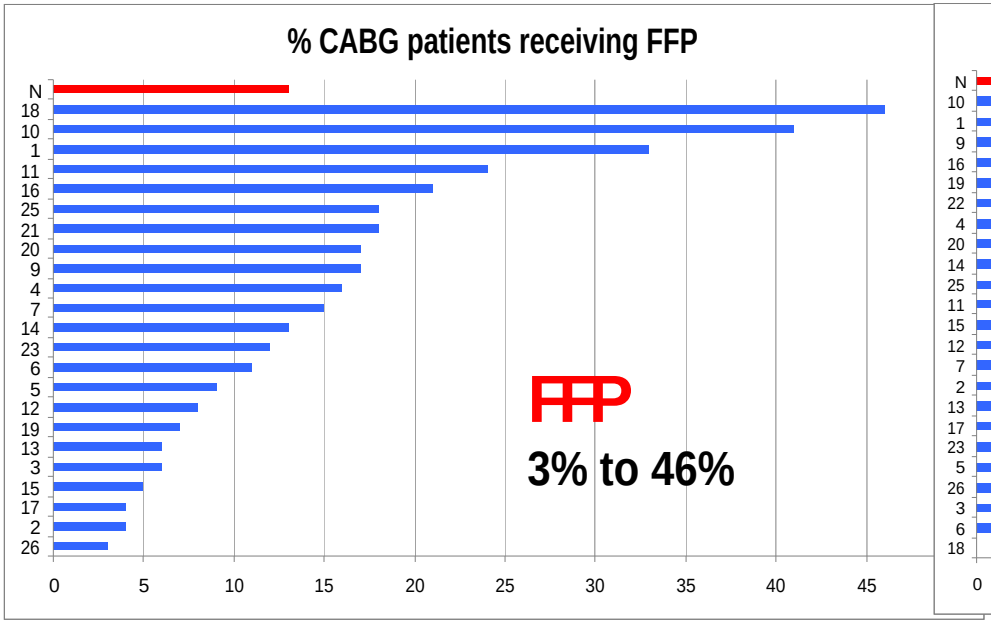
A. Provide regular local data for blood usage for each surgeon and each procedure
B. Introduce perioperative cell salvage
C. Introduce TEG to guide blood component therapy
D. Ensure all cases are pre-assessed so that anaemia can be identified and treated prior to surgery
E. All of the above

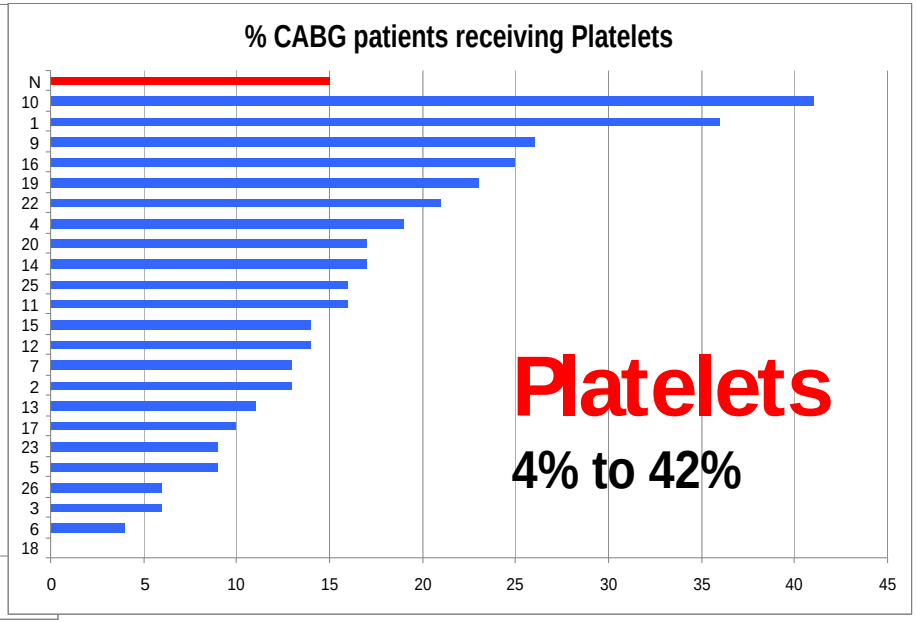


NCA Cardiac Surgery 2011
Clinical lead Mike Murphy and Shubha Allard

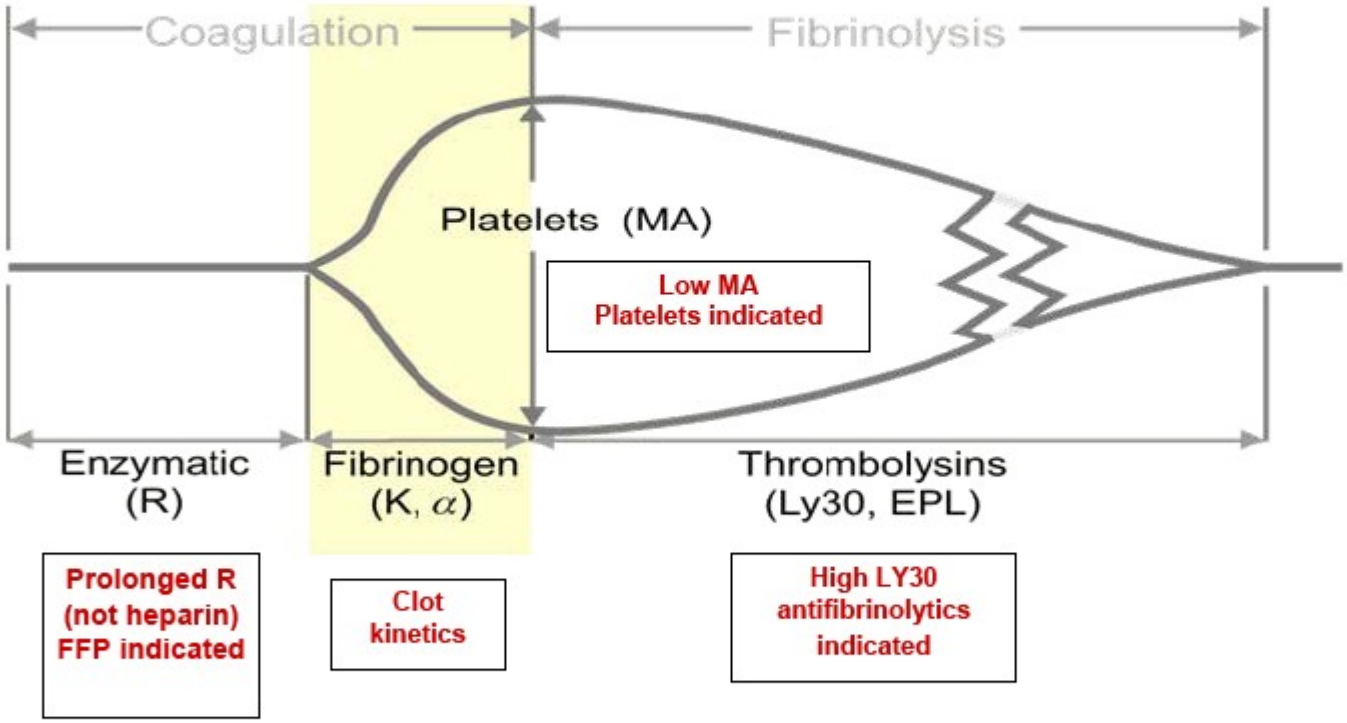
Red Cells

22%- 66%





TEG® Directed Therapy For Bleeding Patient



St Mary's Suggested TEG® Treatment Guide

- Patient Bleeding?
  - YES
    - TEG® Results
      - Normal TEG® Results
        - Have they been On Antiplatelet Therapy?
          - YES
            - Run PlateletMapping® Assess level of inhibition
          - NO
            - CONSIDER RE-EXPLORATION
      - ABNORMAL TEG® Results
        - Reaction Time (R-Time)
          - Heparinase R Normal, Plain R Extended
            - Protamine to reverse excess heparin
          - Pln R = Hep R & R 11-14 mins
            - FFP x 2 or 8mls/kg
          - Pln R = Hep R & R >14mins
            - FFP x 4 or 16mls/kg
        - Maximum Amplitude (MA)
          - MA 40- 47mm G 3.3 – 4.4K
            - 1 Pool Platelets
          - MA <40mm Or G <3.3K
            - 2 Pools Platelets
        - Clot Lysis (LY30)
          - LY30 >7.5% With CI <1.0
            - Primary Fibrinolysis
              - Tranexamic Acid 1-2g (20mg/kg)
          - LY30 >7.5% With CI >3.0
            - Secondary Fibrinolysis
              - Anticoagulant Of Choice
  - NO
    - Do you need to Transfuse?

The platelet requests that can be dealt with by the transfusion laboratory are:

A. Patients with bone marrow failure who have a platelet count below the threshold
B. Patients with major haemorrhage
C. Patients with ITP who have widespread purpura
D. Patients on clopidogrel and aspirin who need elective cardiac surgery
E. An emergency admission with a platelet count of $5x10^9/L$

Last Question: If platelets are ordered for a surgical patient, or a procedure, and not used – when would you take them back into stock?

A. 4 hours after the planned procedure
B. 12 hours after the planned procedure
C. 24 hours after the planned procedure
D. No set time, I would wait for the clinicians to tell me they were no longer needed and then reallocate them

Summary

- Work with your transfusion department to use platelets safely and effectively with minimum wastage
- Familiarise yourself with indication codes and guidelines on major haemorrhage and reversal of anticoagulant and anti-platelet drugs
- Use audits and benchmarking to understand your hospital's practice and to try and improve

The dose of platelets is one unit (1 ATD)
Why use two when one will do?