Transfusion practice in the bleeding critically ill; an international online survey – The TRACE-2 Survey

Supplement 1: Static version online survey

Demographics:

1. In which country do you work?

2. What is your intensive care certification level?
    a. Intensivist
    b. Resident, specialist in training
    c. Specialist non intensivist practicing ICU
    d. Nurse
    e. Student
    f. Other, please specify

3. What is your primary medical speciality?
    a. Anesthesiology
    b. Cardiology
    c. Internal medicine
    d. Neurology
    e. Pediatrics
    f. Pulmonology
    g. Surgery
    h. Other, please specify

4. Type of intensive care unit (ICU)
    a. Medical ICU
    b. Surgical ICU
    c. Mixed ICU
    d. Other, please specify

5. Number of ICU beds
    a. <10
    b. 10-15
    c. 16-20
    d. >20

6. Type of institution
    a. University hospital
    b. University affiliated hospital
    c. Non-university public hospital
    d. Private hospital
    e. Other, please specify

7. What kind of transfusion protocol do you have in your hospital? (multiple answers possible)
    a. Hospital-wide transfusion protocol
    b. ICU-specific transfusion protocol
    c. Massive transfusion protocol
    d. Other, please specify

Massive transfusion
The following questions concern ICU patients that have massive blood loss.

Massive blood loss is defined as:
Systolic blood pressure <90mmHg with bleeding + non-responsive to resuscitation therapy
OR ≥4 products within 2 hours
OR When a massive transfusion protocol (MTP) is initiated

8. What kind of plasma do you use during massive transfusion? (multiple answers possible)
    a. Pooled plasma (e.g. Omniplasma)
    b. Fresh frozen plasma
    c. Lyophilized plasma

9. What guides the choice of type of blood products prescribed to patients with requiring massive transfusion? (multiple answers possible)
    a. I use fixed ratios of blood products
    b. Conventional lab based testing (e.g. INR, platelet count, fibrinogen, hemoglobin)
    c. Point of care viscoelastic testing (TEG/ROTEM)

10. What ratio of blood products do you use in your massive transfusion protocol? (one platelet concentrate = pooled product from 5 donors)
    a. 1 : 1 : 1 (red blood cells : plasma : platelets concentrate)
    b. 3 : 3 : 1 (red blood cells : plasma : platelets concentrate)
    c. 6 : 6 : 1 (red blood cells : plasma : platelets concentrate)
    d. 6 : 3 : 1 (red blood cells : plasma : platelets concentrate)
    e. Whole blood
    f. Other, please specify

11. How do you correct a plasmatic coagulopathy (International Normalized Ratio > x1.5 reference value or prolonged cloth time with TEG/ROTEM) in critically ill patients with massive blood loss in the ICU who used vitamin K antagonists? (multiple answers possible)
    a. Vitamin K
    b. Prothrombin complex (Cofact/Octoplex/Beriplex)
    c. Plasma
    d. Nothing
    e. Other, please specify

12. How do you correct a plasmatic coagulopathy in critically ill patients with massive blood loss in the ICU who used direct oral anti-coagulants (DOAC's)? (multiple answers possible)
    a. Vitamin K
    b. Prothrombin complex (Cofact/Octoplex/Beriplex)
    c. Plasma
    d. Recombinant factor VIIa
    e. Idarucizumab (for dabigatran)
    f. Andexanet (for rivaroxaban or apixaban)
    g. Nothing
    h. Other, please specify

13. What guides your use of fibrinogen in critically ill patients with massive bleeding? (multiple answers possible)
    a. I empirically administer fibrinogen

b. I empirically administer fibrinogen, but start titrating when first lab results are available
c. I administer fibrinogen after lab testing (fibrinogen level)
d. I administer fibrinogen after viscoelastic testing (TEG/ROTEM)
e. Other, please specify

14. What guides your use of prothrombin complex (Cofact/Octoplex/Beriplex) in critically ill patients with massive bleeding? (multiple answers possible)
    a. I empirically administer prothrombin complex
    b. I empirically administer prothrombin complex, but start titrating when first lab results are available
    c. I administer prothrombin complex after lab testing (INR/PT)
    d. I administer prothrombin complex after viscoelastic testing (TEG/ROTEM)
    e. Other, please specify

15. Do you use tranexamic acid in critically ill patients with massive bleeding?
    a. Yes
    b. No

16. What guides your use of tranexamic acid in critically ill patients with massive bleeding? (multiple answers possible)
    a. I empirically administer tranexamic acid
    b. I administer tranexamic acid after viscoelastic testing (TEG/ROTEM)
    c. Other, please specify

17. Do you give tranexamic-acid in massive bleeding critically ill patients who are considered…

	Always	Most of the time	Sometimes	Never
A general bleeding ICU population				
Traumatic bleeding				
Upper gastrointestinal tract bleeding				
Post-cardiothoracic surgery bleeding				
Obstetric bleeding				
Sepsis + bleeding				
Disseminated intravascular coagulation + bleeding				
Extracorporeal membrane oxygenation + bleeding				
Hemorrhagic stroke and/or traumatic brain injury + bleeding				

Red blood cell transfusion

The following questions concern ICU patients that have non-massive blood loss.

18. Which unit do you use to measure hemoglobin levels?
    a. g/dl
    b. g/L (=mg/ml)
    c. mmol/L

What is your threshold for red blood cell concentrate (RBC) transfusion in...

19. … a general population of non-massively bleeding critically ill patients?
20. … traumatic non-massively bleeding critically ill patients?
21. … upper gastrointestinal-tract non-massively bleeding critically ill patients?
22. … post-cardiothoracic surgery non-massively bleeding critically ill patients?
23. … obstetric non-massively bleeding critically ill patients?
24. … septic non-massively bleeding critically ill patients?
25. … non-massively bleeding critically ill patients on extracorporeal membrane oxygenation?
26. … non-massively bleeding critically ill patients suffering from a hemorrhagic stroke and/or traumatic brain injury?

27. Do you check hemoglobin levels before transfusing a second unit of RBC in non-massively bleeding critically ill patients in the ICU?
    a. Always
    b. Most of the time
    c. Sometimes
    d. Never

Platelets

What is your threshold for platelet transfusion in...

28. … a general population of non-massively bleeding critically ill patients? (10^9 cells/L)
29. … traumatic non-massively bleeding critically ill patients? (10^9 cells/L)
30. … upper gastrointestinal-tract non-massively bleeding critically ill patients? (10^9 cells/L)
31. … post-cardiothoracic surgery non-massively bleeding critically ill patients? (10^9 cells/L)
32. … obstetric non-massively bleeding critically ill patients? (10^9 cells/L)
33. … non-massively bleeding critically ill patients suffering from sepsis and/or disseminated intravascular coagulation? (10^9 cells/L)
34. … non-massively bleeding critically ill patients on extracorporeal membrane oxygenation? (10^9 cells/L)
35. … non-massively bleeding critically ill patients suffering from a hemorrhagic stroke and/or traumatic brain injury? (10^9 cells/L)
36. … non-massively bleeding critically ill patients receiving anti-platelet therapy (e.g. acetylsalicylic acid, dipyridamol, clopicogrel, ticagrelor)? (10^9 cells/L)

37. Do you check platelet count after transfusion of one unit thrombocyte concentrate before transfusing a second unit in non-massive bleeding critically ill patients in the ICU?
    a. Always
    b. Most of the time
    c. Sometimes
    d. Never

Plasma

38. Which coagulation test do you use in order to decide whether a non-massively bleeding critically ill patient could benefit from a plasma transfusion? (multiple answers possible)
    a. PT/INR
    b. aPTT
    c. Fibrinogen
    d. Rotational thromboelastometry (ROTEM)
    e. Thromboelastography (TEG)
    f. Other, please specify

39. From which INR-value would you consider transfusing plasma to a general population of non-massively bleeding critically ill patients?

40. Do you check the PT/INR or perform TEG/ROTEM before transfusing a second unit of plasma in a non-massively bleeding critically ill patient with plasmatic coagulopathy?
    a. Always
    b. Most of the time
    c. Sometimes
    d. Never

Coagulation products

What is your threshold for administering fibrinogen in...

41. … a general population of non-massively bleeding critically ill patients? (10^9 cells/L)
42. … traumatic non-massively bleeding critically ill patients? (10^9 cells/L)
43. … upper gastrointestinal-tract non-massively bleeding critically ill patients? (10^9 cells/L)
44. … post-cardiothoracic surgery non-massively bleeding critically ill patients? (10^9 cells/L)
45. … obstetric non-massively bleeding critically ill patients? (10^9 cells/L)
46. … non-massively bleeding critically ill patients suffering from sepsis and/or disseminated intravascular coagulation? (10^9 cells/L)
47. … non-massively bleeding critically ill patients on extracorporeal membrane oxygenation? (10^9 cells/L)
48. … non-massively bleeding critically ill patients suffering from a hemorrhagic stroke and/or traumatic brain injury? (10^9 cells/L)

49. What guides your use of tranexamic acid (TXA) in critically ill patients with non-massive bleeding?
    a. I empirically administer TXA
    b. I administer TXA after viscoelastic testing (TEG/ROTEM)
    c. Other (please specify)

Tranexamic-acid

50. Do you give tranexamic-acid in non-massively bleeding critically ill patients who are considered…

	Always	Most of the time	Sometimes	Never
A general bleeding ICU population				
Traumatic bleeding				
Upper gastrointestinal tract bleeding				
Post-cardiothoracic surgery bleeding				
Obstetric bleeding				
Sepsis + bleeding				
Disseminated intravascular coagulation + bleeding				
Extracorporeal membrane oxygenation + bleeding				
Hemorrhagic stroke and/or traumatic brain injury + bleeding				