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

Supplement 3: Supplemental tables

	Massive transfusion protocol (N= 209)	No massive transfusion protocol (N= 192)	P-value
What kind of plasma do you use during massive transfusion?			
Pooled plasma (e.g. Omniplasma)	19(9%)	10(5%)	0.191
Fresh frozen plasma	196(94%)	174(91%)	0.32
Lyophilized plasma	7(3%)	5(3%)	0.885
What guides the choice of type of blood products prescribed to patients requiring massive transfusion?			
I use fixed ratios of blood products	120(57%)	64(33%)	p<0.001
Conventional lab based testing (e.g. International Normalized Ratio (INR), platelet count , fibrinogen, hemoglobin)	133(64%)	135(70%)	0.189
Point of care viscoelastic testing (Thromboelastography (TEG) or Thromboelastometry (ROTEM))	101(48%)	62(32%)	0.002
What ratio of blood products do you use during massive transfusion (one platelet concentrate = pooled product from 5 donors)			
1 : 1 : 1 (red blood cells : plasma : platelets concentrate)	43(21%)	17(9%)	0.023
3 : 3 : 1 (red blood cells : plasma : platelets concentrate)	29(14%)	16(8%)	
6 : 6 : 1 (red blood cells : plasma : platelets concentrate)	11(5%)	8(4%)	
6 : 3 : 1 (red blood cells : plasma : platelets concentrate)	10(5%)	13(7%)	
Other (please specify)	29(14%)	9(5%)	
Whole blood	0(0%)	2(1%)	
How do you correct a plasmatic coagulopathy (INRx1.5 reference value or prolonged clotting time with TEG or ROTEM) in critically ill patients with massive blood loss who used vitamin K antagonists?			
Vitamin K	144(69%)	130(68%)	0.882
Prothrombin complex (Cofact/Octoplex/Beriplex)	178(85%)	136(71%)	0.001
Plasma	114(55%)	132(69%)	0.005
Nothing	1(0%)	2(1%)	0.941
How do you correct a plasmatic coagulopathy in critically ill patients with massive blood loss who used direct oral anti-coagulants(DOACs)?			
Vitamin K	45(22%)	47(24%)	0.56
Prothrombin complex (Cofact/Octoplex/Beriplex)	155(74%)	118(61%)	0.009
Plasma	119(57%)	137(71%)	0.004
Recombinant factor VIIa (Novoseven/Eptacog Œ±)	32(15%)	36(19%)	0.433
Idarucizumab (for dabigatran)	119(57%)	75(39%)	0.001
Andexanet (for rivaroxaban or apixaban)	51(24%)	33(17%)	0.099
Nothing	3(1%)	3(2%)	1
What guides your use of fibrinogen in critically ill patients with massive bleeding?			
I administer fibrinogen after lab testing (fibrinogen level)	67(32%)	79(41%)	0.331
I administer fibrinogen after viscoelastic testing (TEG/ROTEM)	41(20%)	37(19%)	
I empirically administer fibrinogen	26(12%)	17(9%)	

I empirically administer fibrinogen, but start titrating when first lab results are available	69(33%)	52(27%)	
Other	6(3%)	6(3%)	
What guides your use of prothrombin complex (Cofact, Octoplex,Beriplex) in critically ill patients with massive bleeding.			
I administer prothrombin complex after lab testing (PT/INR)	77(37%)	80(42%)	0.494
I administer prothrombin complex after viscoelastic testing (TEG/ROTEM)	54(26%)	37(19%)	
I empirically administer prothrombin complex	14(7%)	10(5%)	
I empirically administer prothrombin complex, but start titrating when first lab results are available	44(21%)	41(21%)	
Other	19(9%)	21(11%)	
Do you use tranexamic acid in critically ill patients with massive bleeding?			
Yes	201(96%)	173(90%)	0.019
No	7(3%)	19(10%)	
What guides your use of tranexamic acid in critically ill patients with massive bleeding?			
I administer tranexamic acid after viscoelastic testing (TEG/ROTEM)	18(9%)	15(8%)	0.040
I empirically administer TXA	180(86%)	152(79%)	
Other	4(2%)	5(3%)	
Primary medical specialty			
Anesthesiology	127(61%)	116(60%)	0.025
Cardiology	1(0%)	6(3%)	
Internal medicine	41(20%)	37(19%)	
Neurology	1(0%)	0(0%)	
Other (please specify)	31(15%)	16(8%)	
Pulmology	2(1%)	11(6%)	
Surgery	5(2%)	4(2%)	
Certification level			
Intensivist	176(84%)	161(84%)	0.451
Specialist non-intensivist practising ICU	18(9%)	15(8%)	
Resident, specialist in training	11(5%)	15(8%)	
Other	4(2%)	1(1%)	
Type of ICU			
Mixed ICU	159(76%)	135(70%)	0.011
Medical ICU	8(4%)	25(13%)	
Surgical ICU	36(17%)	28(15%)	
Other (please specify)	4(2%)	4(2%)	
Number of ICU beds			
<10	51(24%)	44(23%)	0.143
10-15	53(25%)	71(37%)	
16-20	36(17%)	28(15%)	
>20	68(33%)	48(25%)	
Type of institution			
University hospital	100(48%)	78(41%)	0.231
University affiliated hospital	56(27%)	48(25%)	
Non-university public hospital	39(19%)	43(22%)	

Private hospital	14(7%)	22(11%)	
Other (please specify)	0(0%)	1(1%)	
Availability of transfusion guideline			
Hospital-wide transfusion protocol	89(43%)	91(47%)	0.386
ICU-specific transfusion protocol	73(35%)	86(45%)	0.056

Table S1. Difference between respondents with and without a massive transfusion protocol

	Anesthesiology (N= 243)	Internal medicine (N= 78)	P-value
Hemoglobin threshold in different subpopulations			
General ICU population	7[7-7.5]	7[7-7]	0.17
Trauma patients	7.6[7-8]	7.2[7-8]	0.619
Upper gastro-intestinal bleeding	7[7-8]	7[7-8]	0.2
Post cardiothoracic surgery	8[8-9]	8[7.4-9]	0.217
Obstetric patients	7[7-8]	7[7-8]	0.941
Patients with Sepsis	7[7-8]	7[7-7.5]	0.076
Patients on ECMO	8[7-9]	8[7-9]	0.842
Patients with TBI or stroke	8[7.4-9]	8[7-9]	0.044
Platelet count thresholds in different subpopulations			
General ICU population	50[20-50]	50[20-50]	0.099
Trauma patients	50[50-79]	50[50-51]	0.087
Upper gastro-intestinal bleeding	50[50-72]	50[50-50]	0.136
Post cardiothoracic surgery	60[50-90]	50[50-70]	0.008
Obstetric patients	50[50-80]	50[50-50]	0.016
Patients with Sepsis	50[21-50]	50[20-50]	0.042
Patients on ECMO	50[49-80]	50[43-77]	0.854
Patients with TBI or stroke	80[50-100]	70[50-100]	0.06
value.anti_platelet	55[50-100]	50[50-76.25]	0.034
Fibrin thresholds in different subpopulations			
General ICU population	1.5[1-1.8]	1.5[1-1.5]	0.685
Trauma patients	1.5[1-2]	1.5[1-2]	0.111
Upper gastro-intestinal bleeding	1.5[1-2]	1.5[1-2]	0.326
Post cardiothoracic surgery	1.5[1-2]	1.5[1-1.7]	0.155
Obstetric patients	1.5[1.2-2]	1.5[1-1.5]	0.005
Patients with Sepsis	1.5[1-2]	1.5[1-1.5]	0.167
Patients on ECMO	1.5[1-2]	1.5[1-1.5]	0.051
Patients with TBI or stroke	1.5[1.2-2]	1.5[1-2]	0.277
Certification level			0.372
Intensivist	199(82%)	70(90%)	
Specialist non-intensivist practising ICU	25(10%)	4(5%)	
Resident, specialist in training	17(7%)	4(5%)	
Other	2(1%)	0(0%)	
Type of ICU			p<0.001
Medical ICU	7(3%)	18(23%)	
Surgical ICU	58(24%)	3(4%)	
Mixed ICU	171(70%)	56(72%)	
Other	5(2%)	1(1%)	
Number of ICU beds			0.906
<10	59(24%)	17(22%)	
10-15	70(29%)	24(31%)	
16-20	43(18%)	13(17%)	
>20	69(28%)	24(31%)	
Type of institution			0.081
University hospital	110(45%)	29(37%)	
University affiliated hospital	64(26%)	26(33%)	
Non-university public hospital	50(21%)	11(14%)	
Private hospital	19(8%)	12(15%)	
Availability of transfusion guideline			

Hospital-wide transfusion protocol	110(45%)	32(41%)	0.514
ICU-specific transfusion protocol	89(37%)	37(47%)	0.107
Massive transfusion protocol	127(52%)	41(53%)	1

Table S2. Difference between respondents with anesthesiology and internal medicine as base specialty

	No hospital-wide transfusion protocol (N=221)	Hospital-wide transfusion protocol (N=180)	P-value
Hemoglobin threshold in different subpopulations			
General ICU population	7[7-7.5]	7[7-7]	0.246
Trauma patients	7.5[7-8]	7.1[7-8]	0.563
Upper gastro-intestinal bleeding	7[7-8]	7[7-8]	0.326
Post cardiothoracic surgery	8[8-9]	8[7.8-9]	0.057
Obstetric patients	7[7-8]	7[7-8]	0.918
Patients with Sepsis	7[7-8]	7[7-8]	0.654
Patients on ECMO	8[7-9]	8[7.1-9]	0.141
Patients with TBI or stroke	8[7-9]	8[7-9]	0.581
Platelet count thresholds in different subpopulations			
General ICU population	50[20-50]	49.5[20-50]	0.103
Trauma patients	50[50-70]	50[50-70]	0.326
Upper gastro-intestinal bleeding	50[50-70]	50[49-53]	0.013
Post cardiothoracic surgery	50[50-89]	50[50-80]	0.049
Obstetric patients	50[50-71]	50[49-70]	0.133
Patients with Sepsis	50[20-50]	50[20-50]	0.791
Patients on ECMO	50[49-80]	50[48-80]	0.93
Patients with TBI or stroke	75[50-100]	70[50-100]	0.195
value.anti_platelet	51[50-100]	50[40-100]	0.12
Fibrin thresholds in different subpopulations			
General ICU population	1.5[1-1.5]	1.5[1-2]	0.753
Trauma patients	1.5[1-2]	1.5[1-2]	0.124
Upper gastro-intestinal bleeding	1.5[1-2]	1.5[1-2]	0.252
Post cardiothoracic surgery	1.5[1-2]	1.5[1-2]	0.895
Obstetric patients	1.5[1.1-2]	1.5[1-2]	0.679
Patients with Sepsis	1.5[1-1.8]	1.5[1-2]	0.967
Patients on ECMO	1.5[1-2]	1.5[1-2]	0.58
Patients with TBI or stroke	1.5[1.5-2]	1.5[1-2]	0.563
Type of ICU			0.192
Medical ICU	18(8%)	15(8%)	
Surgical ICU	40(18%)	24(13%)	
Mixed ICU	159(72%)	135(75%)	
Other	2(1%)	6(3%)	
Number of ICU beds			0.125
<10	63(29%)	32(18%)	
10-15	68(31%)	56(31%)	
16-20	31(14%)	33(18%)	
>20	58(26%)	58(32%)	
Type of institution			0.689
University hospital	95(43%)	83(46%)	
University affiliated hospital	56(25%)	48(27%)	
Non-university public hospital	46(21%)	36(20%)	
Private hospital	23(10%)	13(7%)	
Other	1(0%)	0(0%)	
Availability of transfusion guideline			
ICU-specific transfusion protocol	120(54%)	39(22%)	p<0.001
Massive transfusion protocol	120(54%)	89(49%)	0.354

Table S3. Difference between respondents with and without a hospital wide transfusion protocol

	No ICU-specific transfusion protocol (N= 242)	ICU-specific transfusion protocol (N= 159)	P-value
Hemoglobin threshold in different subpopulations			
General ICU population	7[7-7]	7[7-7.5]	0.937
Trauma patients	7.05[7-8]	7.9[7-8]	0.315
Upper gastro-intestinal bleeding	7[7-8]	7[7-8]	0.542
Post cardiothoracic surgery	8[7.7-9]	8[8-9]	0.723
Obstetric patients	7[7-8]	7[7-8]	0.946
Patients with Sepsis	7[7-8]	7[7-8]	0.573
Patients on ECMO	8[7.2-9]	8[7-9]	0.026
Patients with TBI or stroke	8[7-9]	8[7-9]	0.305
Platelet count thresholds in different subpopulations			
General ICU population	50[20-50]	50[20-50]	0.861
Trauma patients	50[50-70]	50[50-75]	0.868
Upper gastro-intestinal bleeding	50[50-51.5]	50[50-70]	0.321
Post cardiothoracic surgery	50[50-80]	50[50-80.5]	0.901
Obstetric patients	50[50-70]	50[50-70]	0.673
Patients with Sepsis	50[20-50]	50[20-50]	0.258
Patients on ECMO	50[49.75-80]	50[34.75-80]	0.769
Patients with TBI or stroke	71[50-100]	75[50-100]	0.759
value.anti_platelet	50[50-100]	50[49.75-100]	0.344
Fibrin thresholds in different subpopulations			
General ICU population	1.5[1-1.5]	1.5[1-1.92]	0.424
Trauma patients	1.5[1-2]	1.5[1-2]	0.911
Upper gastro-intestinal bleeding	1.5[1-2]	1.5[1-2]	0.641
Post cardiothoracic surgery	1.5[1-2]	1.5[1-2]	0.421
Obstetric patients	1.5[1.1-2]	1.5[1-2]	0.241
Patients with Sepsis	1.5[1-1.9]	1.5[1-1.92]	0.355
Patients on ECMO	1.5[1-2]	1.5[1-2]	0.698
Patients with TBI or stroke	1.5[1.5-2]	1.5[1-2]	0.239
Type of ICU			0.094
Medical ICU	16(7%)	17(11%)	
Surgical ICU	46(19%)	18(11%)	
Mixed ICU	172(71%)	122(77%)	
Other	6(2%)	2(1%)	
Number of ICU beds			0.086
<10	56(23%)	39(25%)	
10-15	75(31%)	49(31%)	
16-20	38(16%)	26(16%)	
>20	71(29%)	45(28%)	
Type of institution			0.835
University hospital	111(46%)	67(42%)	
University affiliated hospital	56(23%)	48(30%)	
Non-university public hospital	57(24%)	25(16%)	
Private hospital	18(7%)	18(11%)	
Availability of transfusion guideline			
Hospital-wide transfusion protocol	141(58%)	39(25%)	p<0.001
Massive transfusion protocol	136(56%)	73(46%)	0.053

Table S4. Difference between respondents with and without an ICU-specific transfusion protocol