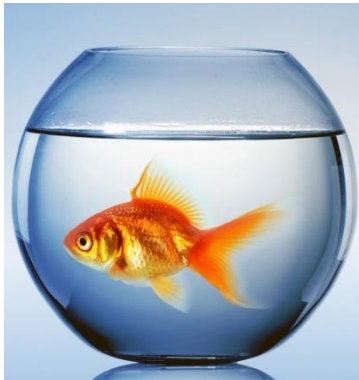




Joint Support Command
Ministry of Defence



NVB PRO-CON DEBAT 2018
Er is **geen** reden voor
"1:1:1"-transfusiebeleid of
transfusiepakketten in de
behandeling van massaal
bloedverlies

Standpunt: **CON**

DOSCO

Military Blood Bank

Dr. F.Noorman

Head Quality Research and Development



PRO "1:1:1", PRO availability

When suspect class III/IV hemorrhage ($\geq 1.5L/5L$)

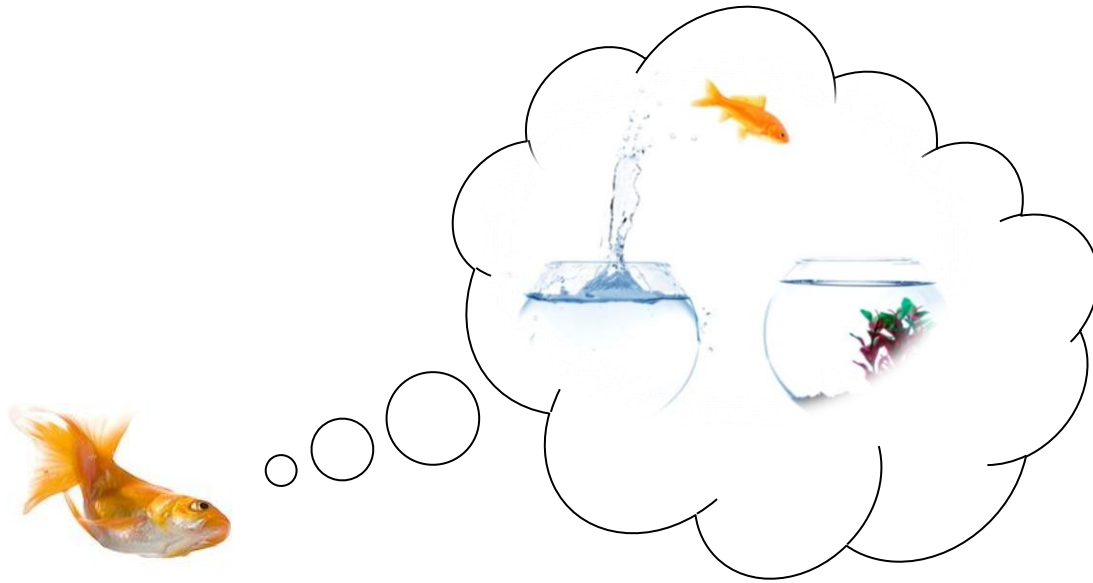
ASAP: Start with 2-4 RBC and 2 Plasma
Then (if needed) followed by packages:

- 1 Platelet unit in plasma
- 3 Plasma
- 4 RBC

After hemodynamic stability achieved:
Sample \rightarrow laboratory based transfusion



Water is to fish, what blood is to humans..
Traumatic to be without it for seconds





Resuscitation....The sooner the better!



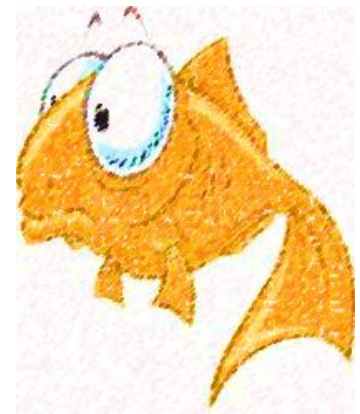
Stop the bleeding
Prevent/Treat ASAP:

- Hypovolemia
- Shock
- Acidosis
- Hypothermia
- Hemodilution





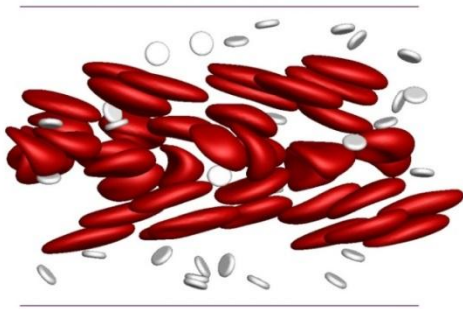
Prevent death, do not use saline for gold fish



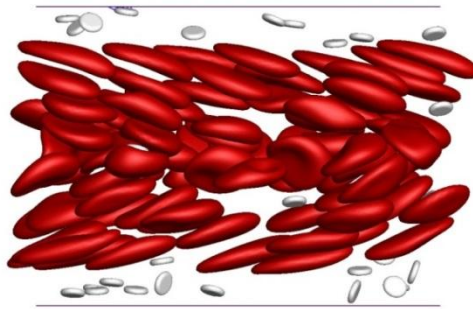


BEST Product for bleeding patients?

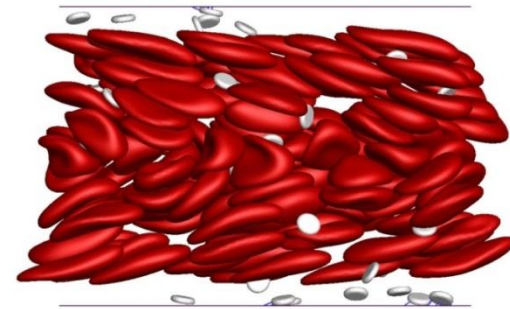
Hematocrit 10%



Hematocrit 20%



Hematocrit 30%



Hypovolemia, acidosis/shock, NO → **RBC**
Microcirculation, Albumin, α_2 M, Haptoglobin,
Coag factors. → **plasma instead of saline**
Deficit thrombin generation → **platelets/MP**

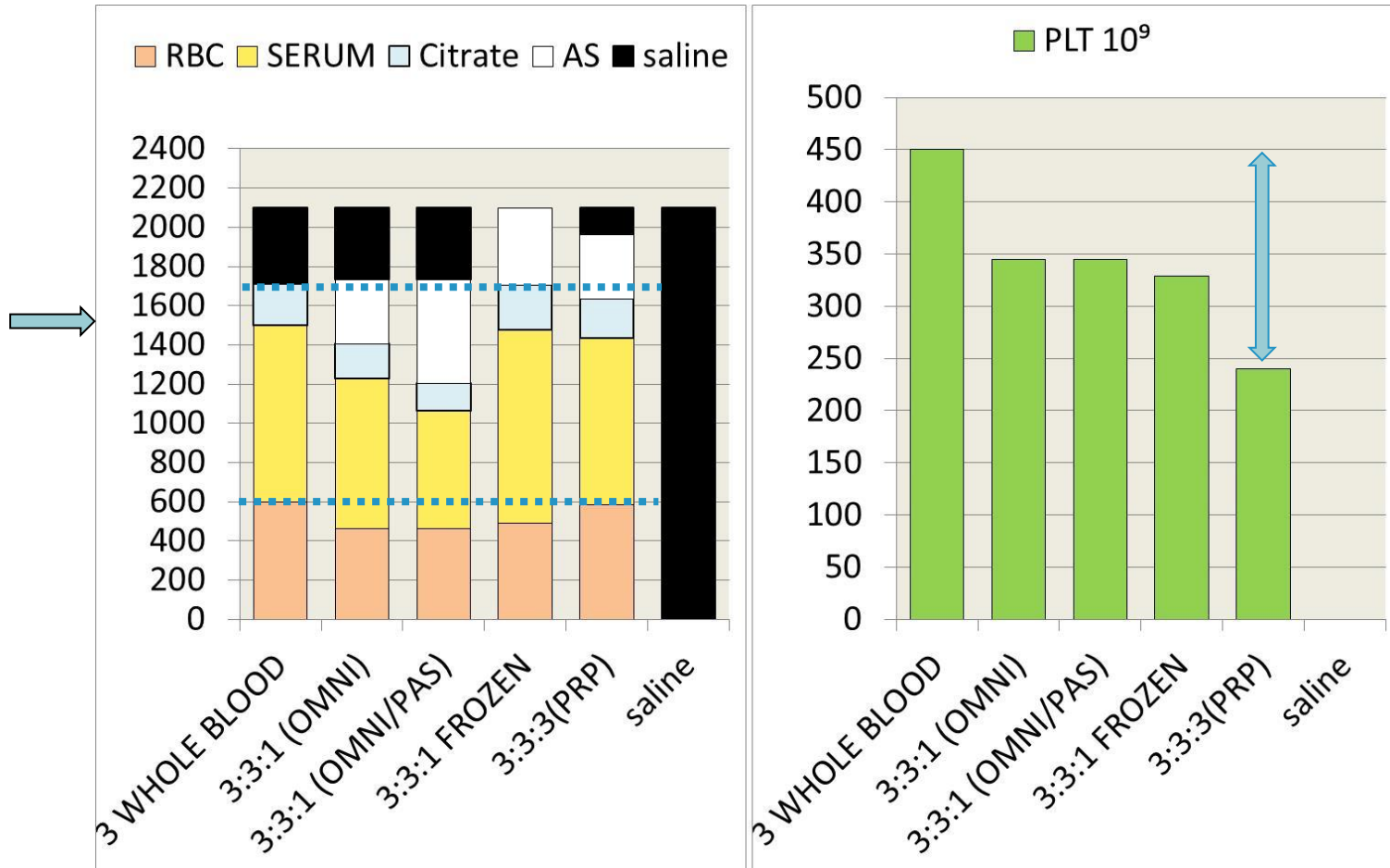


What is 1:1:1?

PRODUCT	RBC ml	Plasma ml	PLT 10 ⁹	AS ml
US WB	180	333	135	0
US RBC	175	33	? 15?	110
US PPP (FFP)		250	? 15?	
US PRP		50	50	
US APH PLT (=6PRP)		300	300	
NLD WB (not avail.)	200	370	150	
NLD RBC (Bc v, LD, SAGM)	154	11	0-15	110
NLD PLT (LD, plasma)		310	300	
NLD PLT (LD, PAS)		110	300	200
NLD FFP (APH)		300	0-15	
NLD OMNIPLAS (S/D)		200	0	



NLD Products; 3 units WB vs 3:3:1 ratio





PRO "1:1:1", PRO availability

When suspect class III/IV hemorrhage ($\geq 1.5L/5L$)

ASAP: Start with 2-4 RBC and 2 Plasma
Then (if needed) followed by packages:

- 1 Platelet unit in plasma
- 3 Plasma
- 4 RBC

After hemodynamic stability achieved:
Sample \rightarrow laboratory based transfusion



Trauma care and/or military scenarios

Pre-hospital resuscitation?

Logistic restraints?

Massive blood loss?

Mass Casualties?





NLD Military Blood Supply

ISAF: Afghanistan, Tarin Kowt 2006-2010

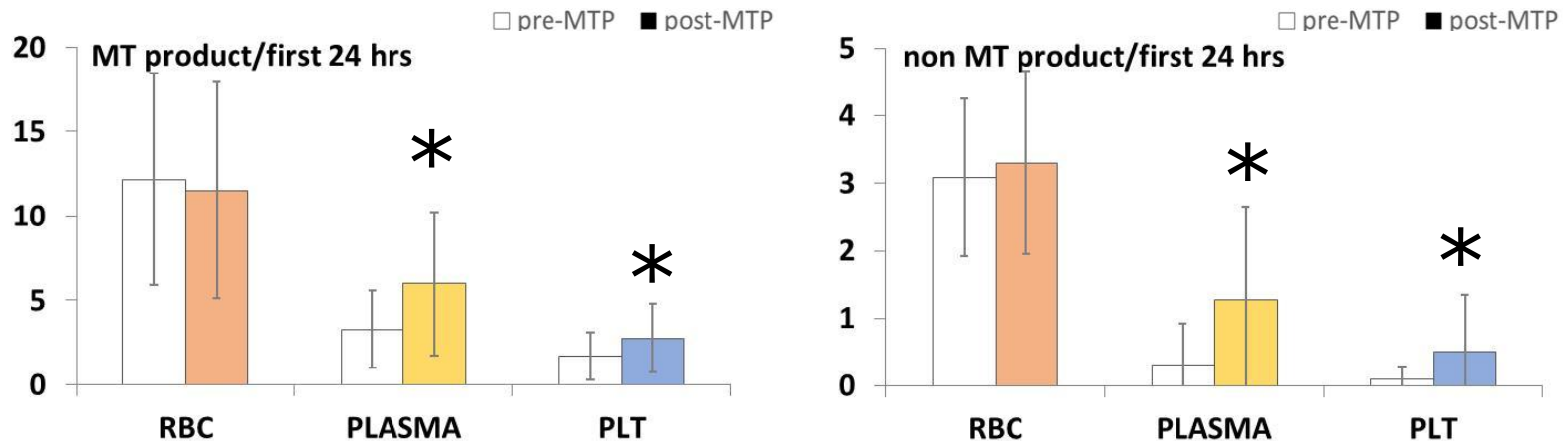
“Transfusion:
-80°C Frozen blood products
are safe and effective
in military casualty care.”



PLOS ONE.
13th Dec 2016
[http://journals.plos.org/plosone/
article?id=10.1371/journal.pone.0168401](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0168401)



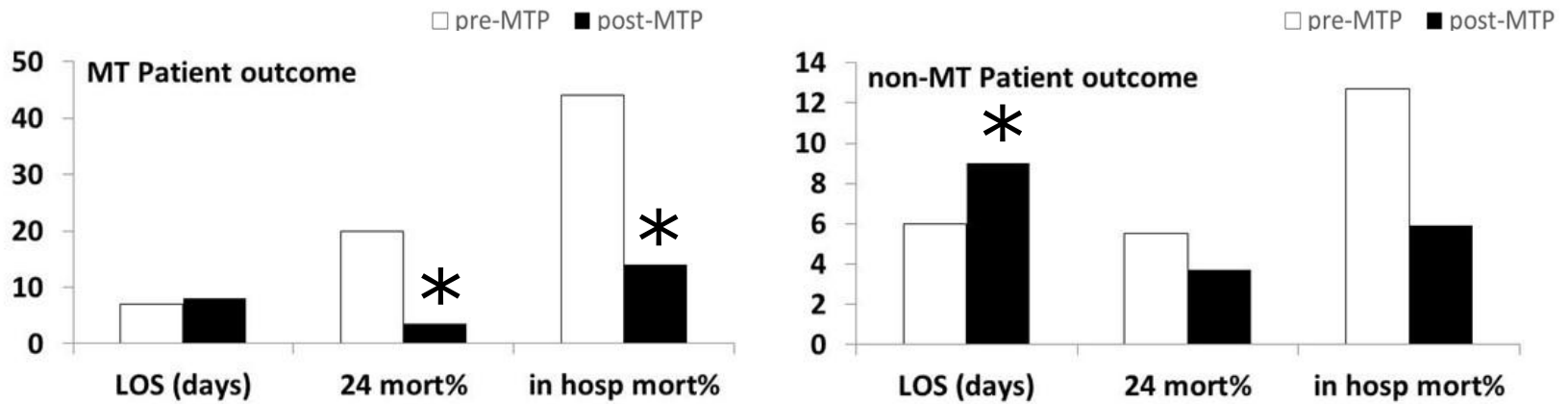
272 trauma patients >0 RBC:
30% ≥ 6 RBC (MT); 70% 1-5 RBC (n-MT) in 24hrs



POST MTP ("4:3:1 ratio") 24hr blood use:
MT **12:6:3 (median 10:5:2)** RBC:Plasma:Plt
Non-MT **3:1:0.5 (median 2:2:0)** RBC:Plasma:Plt



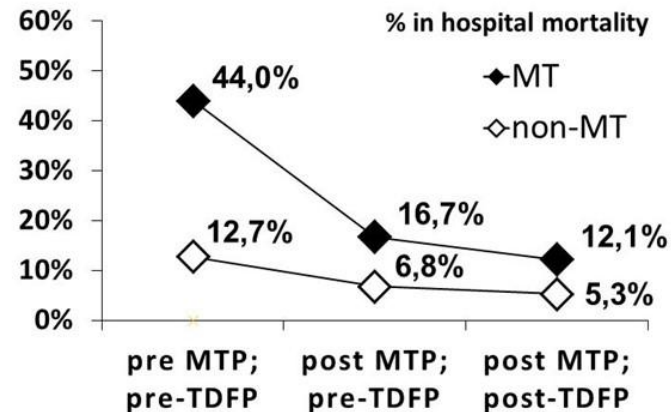
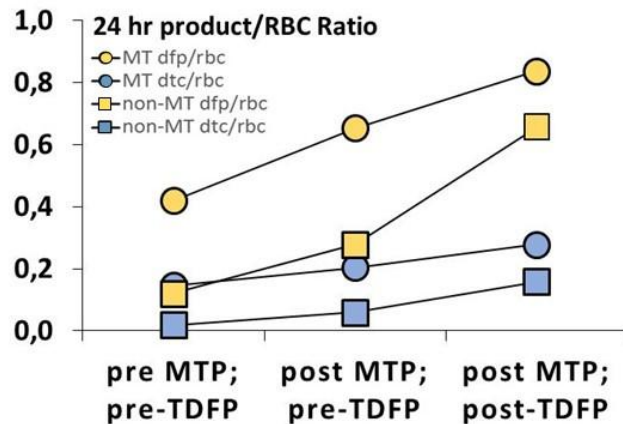
Post MTP lower mortality



Despite increased injury and number of wounds, decreased mortality rates post MTP



Introduction of "4:3:1" MTP (Nov 2007) and 7d, 4°C stored thawed plasma (Apr 2009)



pre-MTP; pre-TDFP: N = 25 MT / 55 non-MT ; post-MTP; pre-TDFP: N = 24 MT / 59 non-MT ; post-MTP; post-TDFP: N = 33 MT / 76 non-MT.

2-4 units Thawed plasma at 4°C (max 7 days) →
Increased and earlier use of MTP →
Decreased mortality



PRO "1:1:1", PRO availability

When suspect class III/IV hemorrhage ($\geq 1.5L/5L$)

ASAP: Start with 2-4 RBC and 2 Plasma (Pre-Hosp?)

Then (if needed) followed by packages:

- 1 Platelet unit in plasma
- 3 Plasma units
- 4 RBC units

After hemodynamic stability achieved:

Sample \rightarrow laboratory based transfusion



Resuscitation.....The sooner the better!



**Stop the bleeding
Prevent/Treat ASAP:
With compatible, safe
blood products in a
"1:1:1" ratio.**





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