ORBCoN
Ontario Regional Blood Coordinating Network

Inspiring and facilitating best transfusion practices in Ontario.

Pre-Hospital Transfusion

Dr Nick Crombie
Birmingham, UK

Faculty Disclosure

In compliance with CPD policy, Temerty Faculty of Medicine requires the following disclosures to the session audience

- This program has received no financial external support
- I have no conflicts of interest

- I take full responsibility for my own views and opinions and am more than happy to debate them further over a beer...

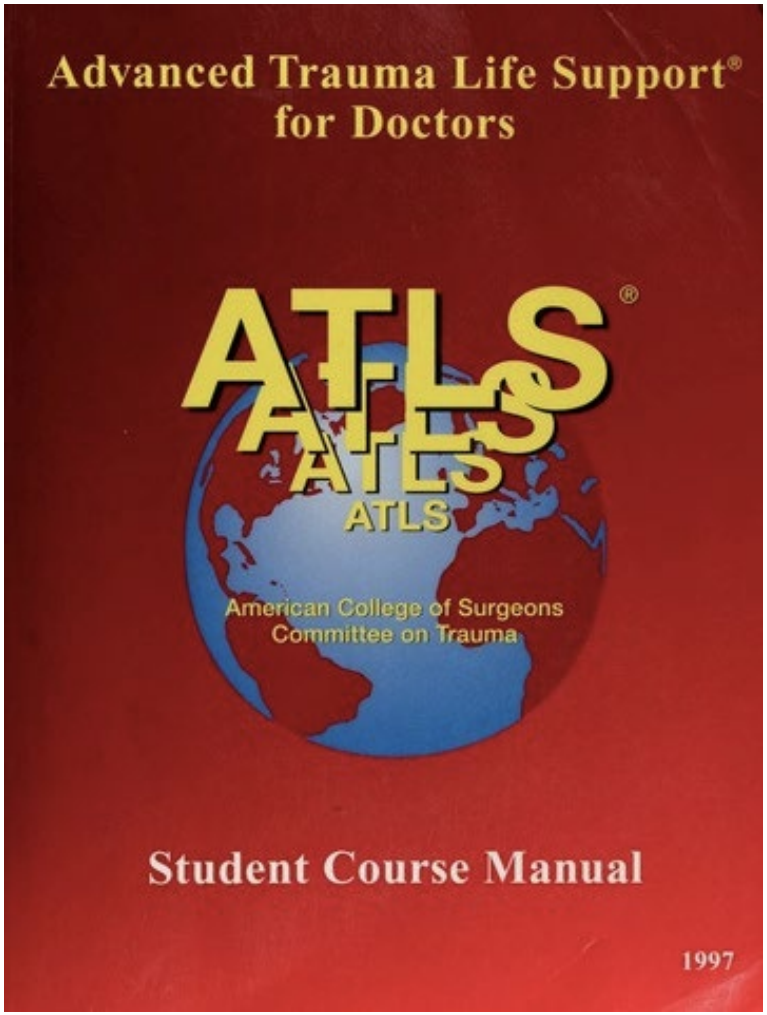
Objectives

- Where have we come from?
- Where are we now?
- Is where we are actually any good?
- Where should we heading next?
- How do we get there?

Objectives


IWM


CONTENTS OF CASE
TRANSFUSION NEEDLES
DIRECTIONS FOR USE


Advanced Trauma Life Support®
for Doctors
ATLS®
American College of Surgeons
Committee on Trauma
Student Course Manual
1997


0.9% Sodium
Chloride
Injection USP
1000 mL
Baxter


0.9% Sodium
Chloride
Injection USP
1000 mL
Baxter

O'Reilly, D.J., Morrison, J.J., Jansen, J.O., Apodaca, A.N., Rasmussen, T.E. and Midwinter, M.J., 2014. Prehospital blood transfusion in the en route management of severe combat trauma: a matched cohort study. *Journal of Trauma and Acute Care Surgery*, *77*(3), pp.S114-S120.

Health

Air ambulance first in UK to carry blood

By Neil Bowdler
Health reporter, BBC News

7 March 2012 | Health

London's Air Ambulance is carrying blood supplies from Tuesday - the first such service in the UK to do so.

The air ambulance will carry O-negative which can be transfused safely into any patient

The innovation has been made possible due to a new refrigeration unit used by the British and American military.

It will allow blood transfusions to be administered on the scene of accidents, rather than later in hospitals.

London's Air Ambulance believes hundreds of lives could be saved, and regional services are looking to follow suit.

SHOCK®
Injury, Inflammation, and Sepsis: Laboratory and Clinical Approaches

Effect of Prehospital Red Blood Cell Transfusion on Mortality and Time of Death in Civilian Trauma Patients

Rehn, Marius[*,†,‡]; Weaver, Anne[*,§]; Brohi, Karim[§,||]; Eshelby, Sarah[*]; Green, Laura[§,||,¶]; Røislien, Jo[†,‡]; Lockey, David J.[*,‡,§,||]

Conclusions:

phRTx was associated with increased survival to hospital, but not overall survival. The "delay death" effect of phRTx carries an impetus to further develop inhospital strategies to improve survival in severely bleeding patients.


Blood is for bleeding
Saltwater is for cooking pasta
P. Spinella 2017


Andrew D. Fisher @FisherAD1 · 13 Dec 2020
I'm still on a crusade to eliminate #pastawater resuscitation in hemorrhagic shock.
WHOLE BLOOD
PASTA WATER

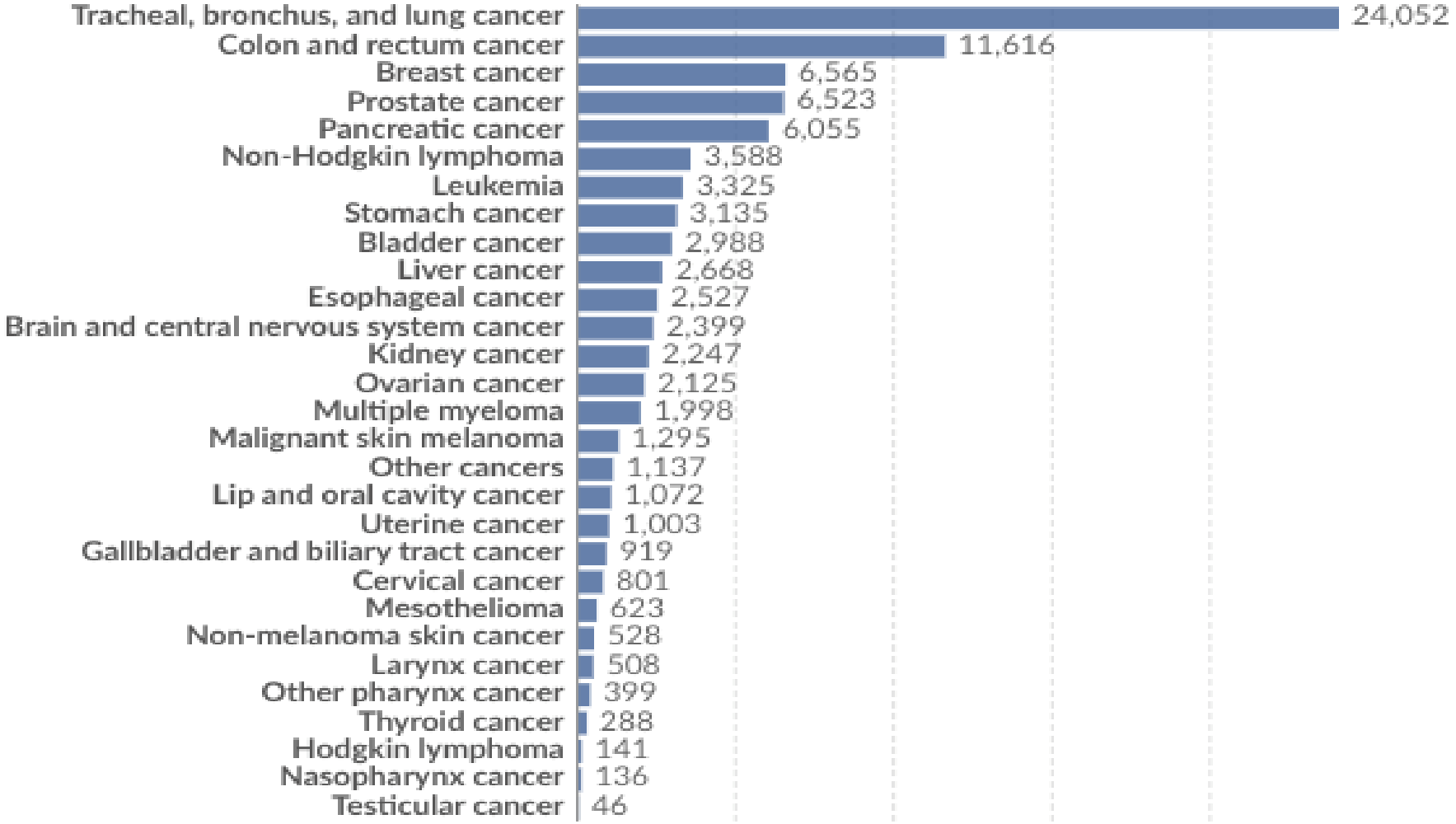
Cancer deaths by type, Canada, 2019

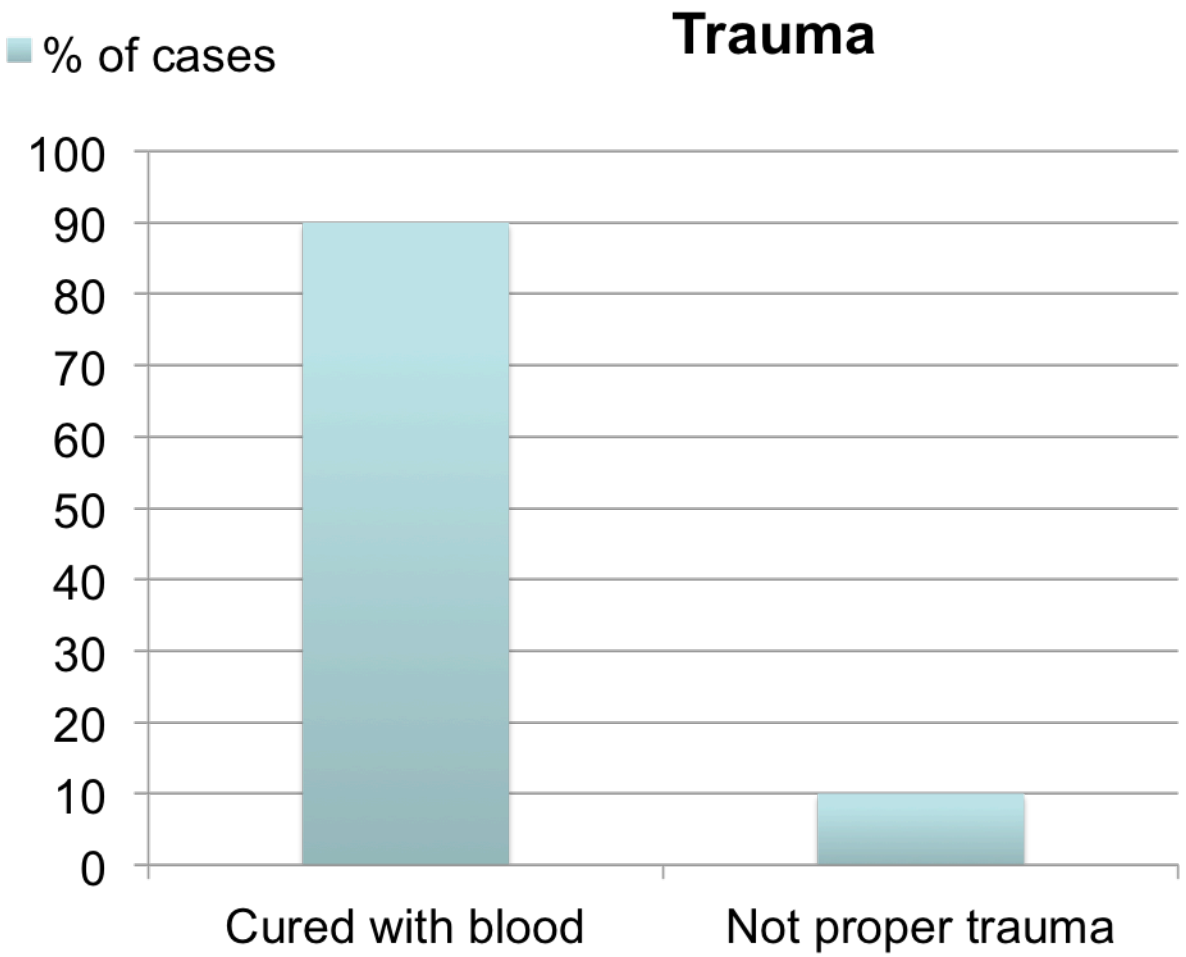
Our World in Data

Total annual number of deaths from cancers across all ages and both sexes, broken down by cancer type.

Table | Chart

Change country or region




Trauma
% of cases
100
90
80
70
60
50
40
30
20
10
0
Cured with blood
Not proper trauma

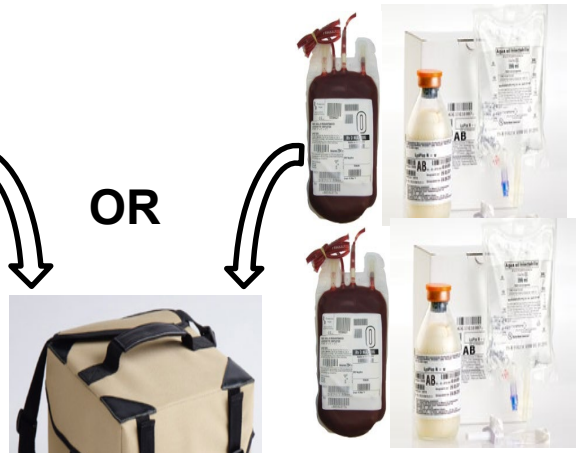
Trauma is not homogenous

EVIDENCE

Resuscitation with Pre-Hospital bLood products

RePHILL

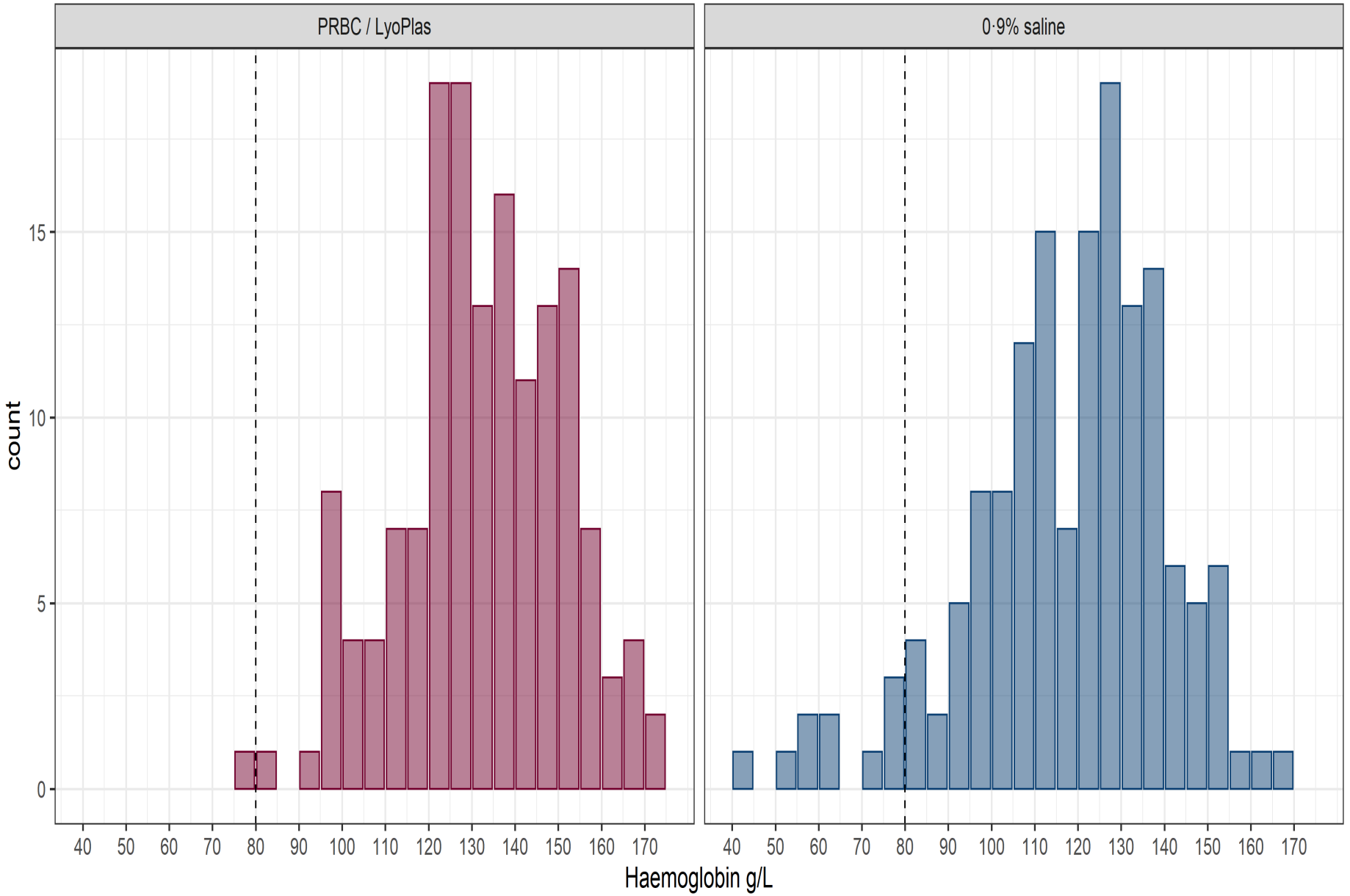
OR

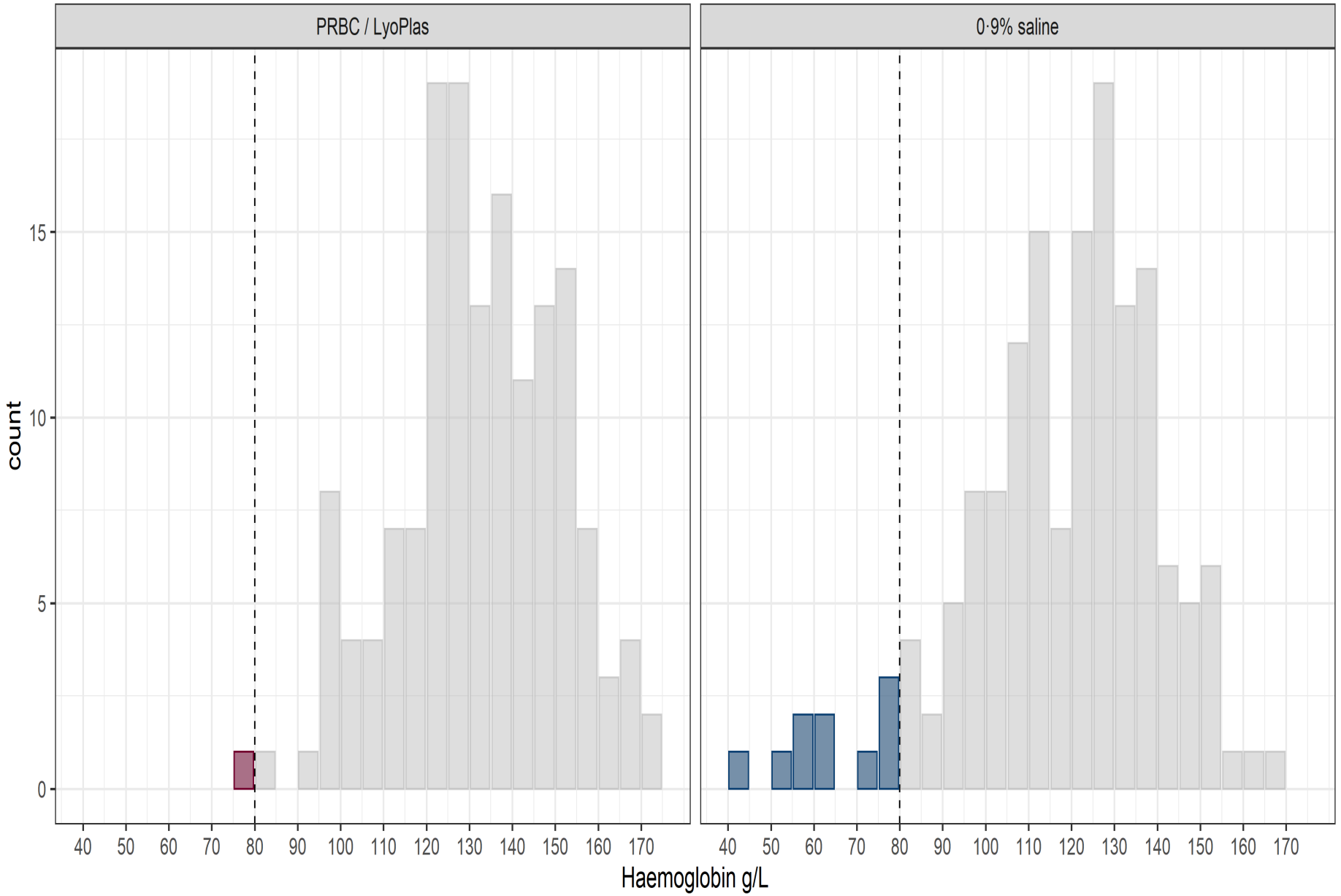


Headlines

- No difference (p=0.996)

- Reduced 3 hour mortality (p=0.08)
- No overall mortality reduction (p=0.44)
- More transfusion in following 24h
- Higher arrival Hb


PRBC / LyoPlas
0·9% saline
count
0
5
10
15
40
50
60
70
80
90
100
110
120
130
140
150
160
170
Haemoglobin g/L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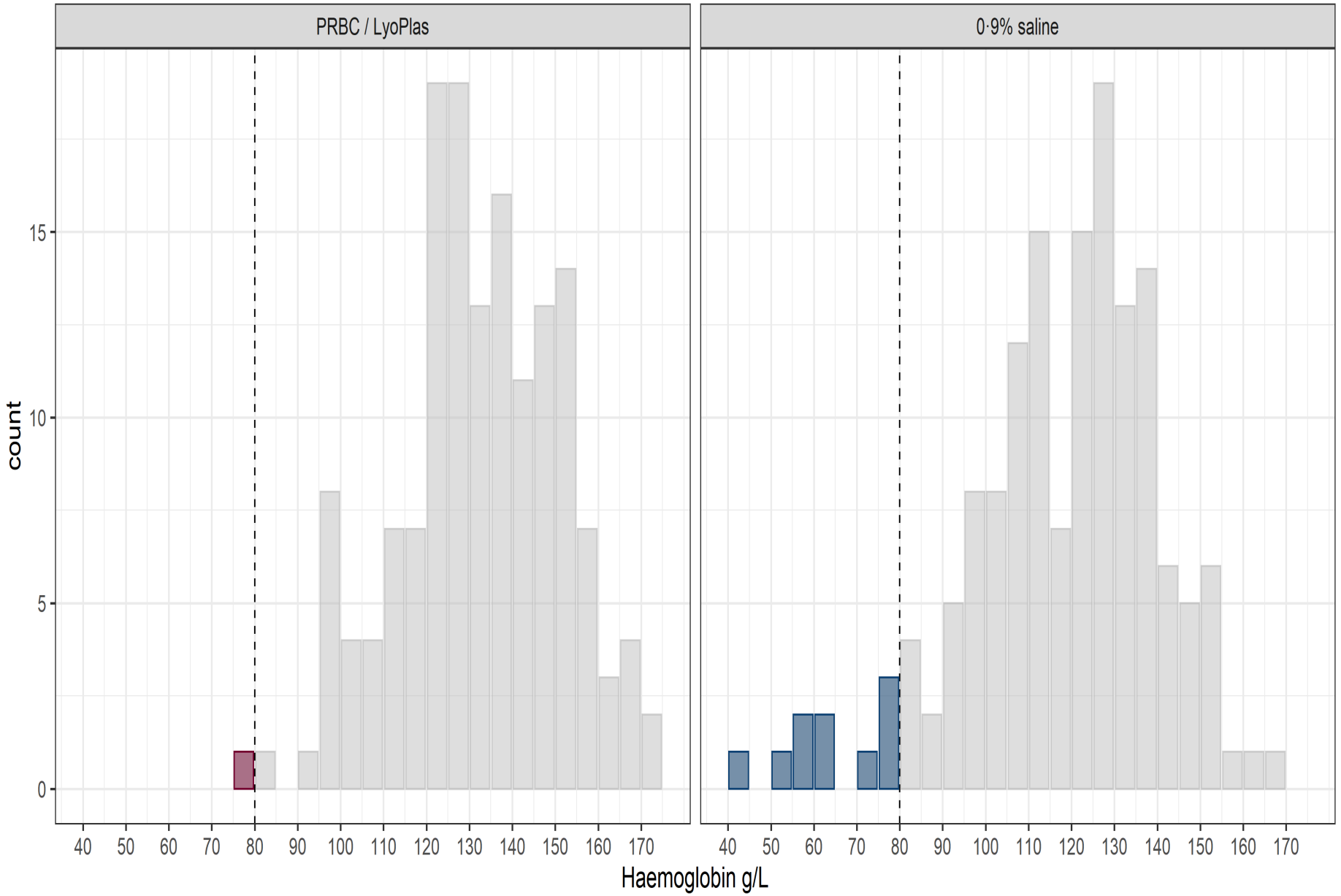
120
130
140
150
160
170
Haemoglobin g/L

"Pasta Water"

Sodium 154 mmol/L
Chloride 154 mmol/L

Crombie's Magic Resuscitation Fluid

pCO_2	79 mmHg
Bicarbonate	11.1 mmol/L
Base Excess	29.2 mmol/L
Potassium	20.5 mmol/L
Sodium	126 mmol/L
Glucose	24.1 mmol/L
Lactic Acid	9.4 mmol/l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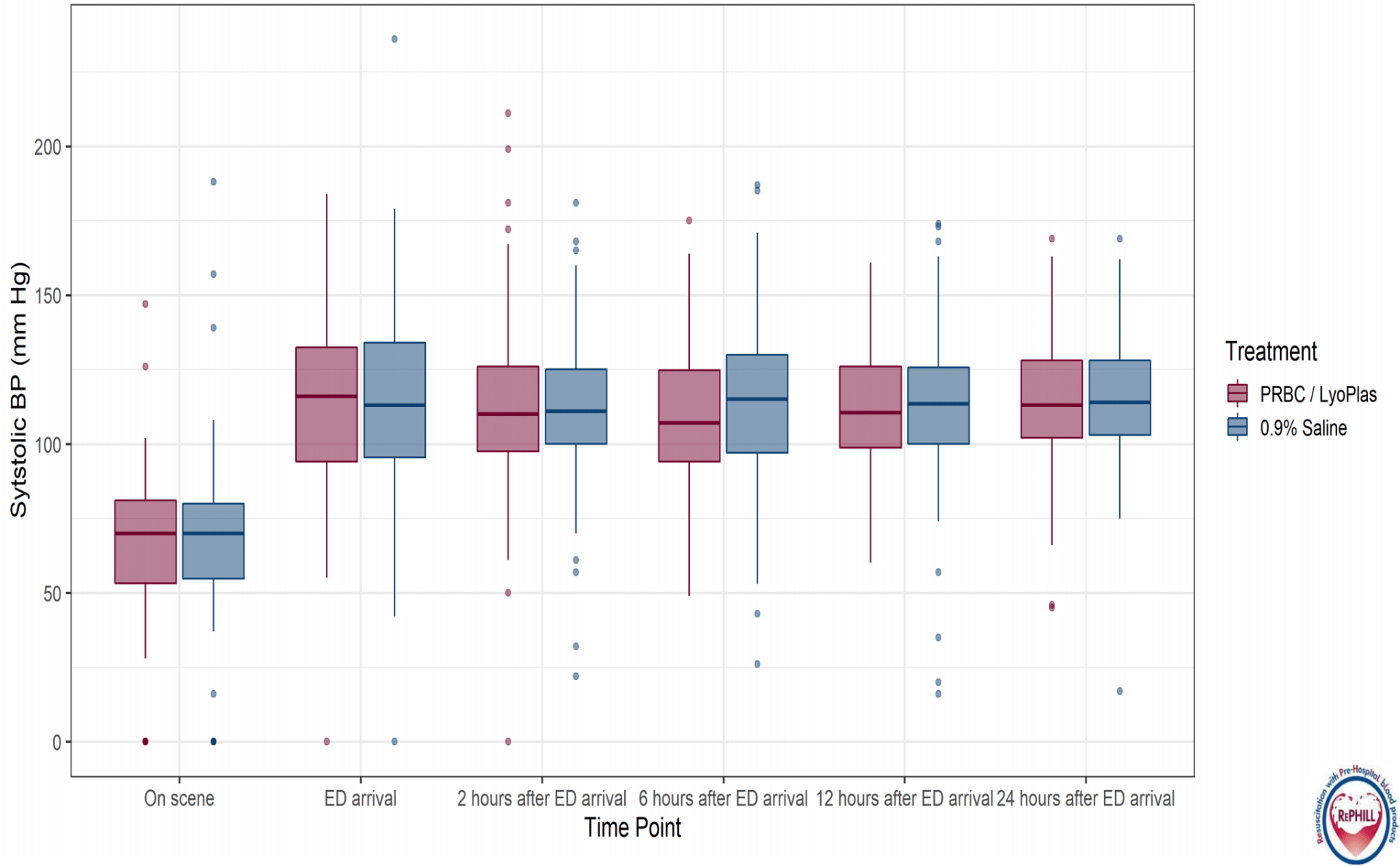
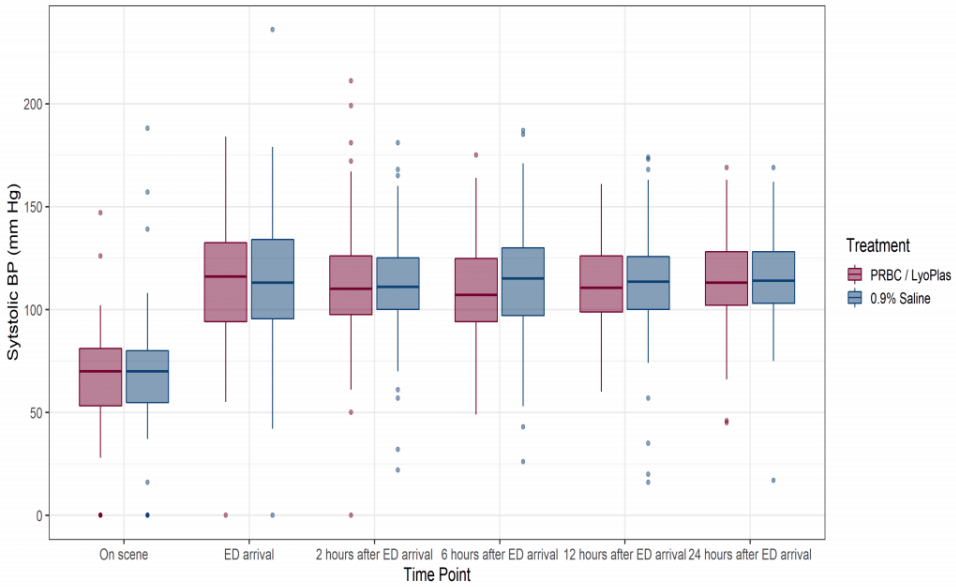
Haemoglobin g/L

Physiology: Systolic Blood Pressure



Physiology: Systolic Blood Pressure



After arrival to 24h:

GROUP	PRC	Lyo
Saline	4.4	3.3
PRC/LYO	6.0	5.7

Pre-Randomisation: 438ml crystalloid and 1g TXA

Treatment : Blood products 710ml

or Saline 638ml

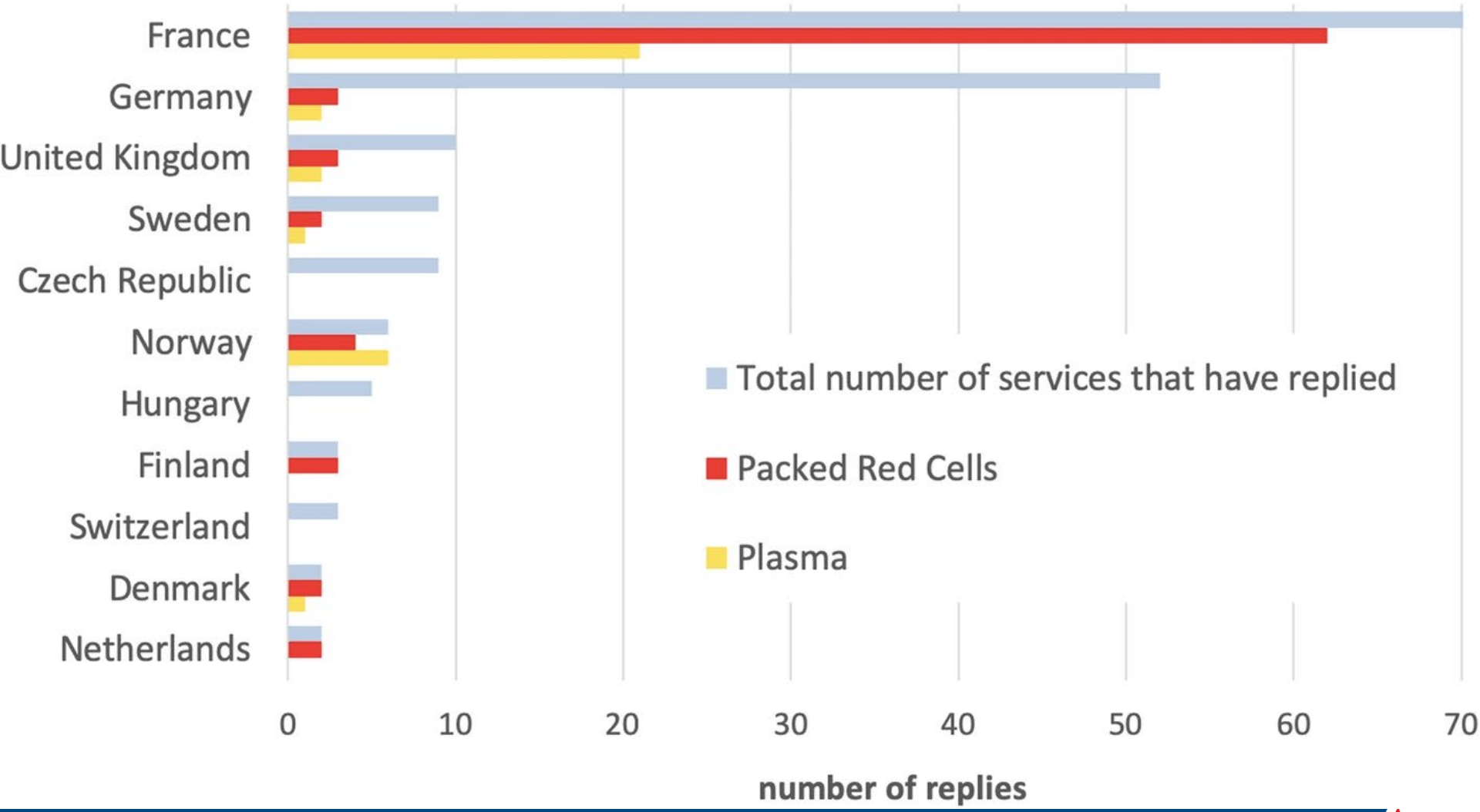
Original research | Open access | Published: 14 August 2020

Pre-hospital blood transfusion – an ESA survey of European practice

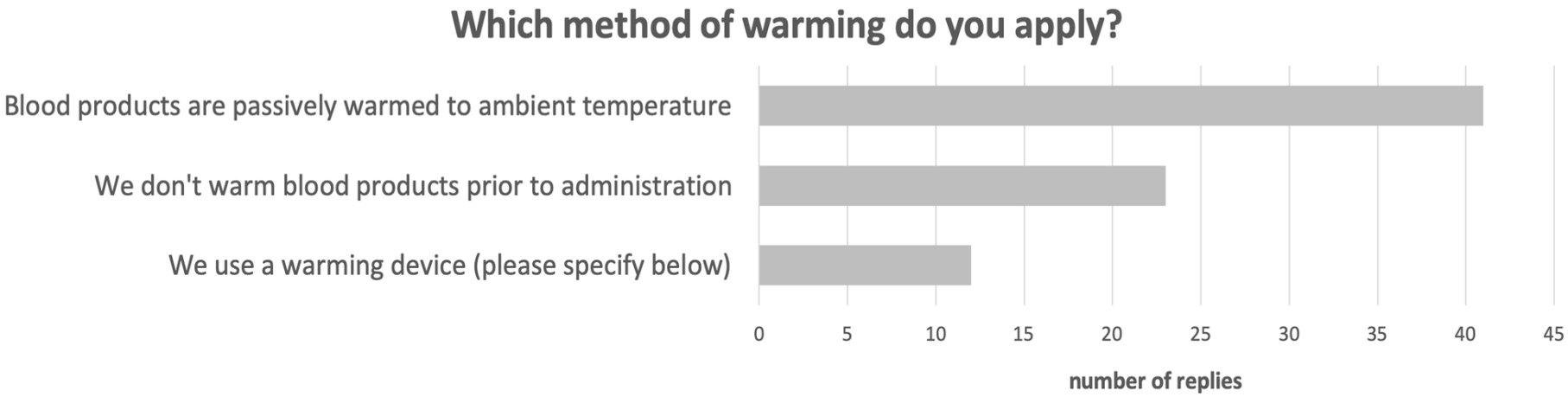
Karl-Christian Thies ✉, Anatolij Truhlář, Damian Keene, Jochen Hinkelbein, Kurt Rützler, Luca Brazzi & Benoît Vivien

Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine **28**, Article number: 79 (2020) | Cite this article

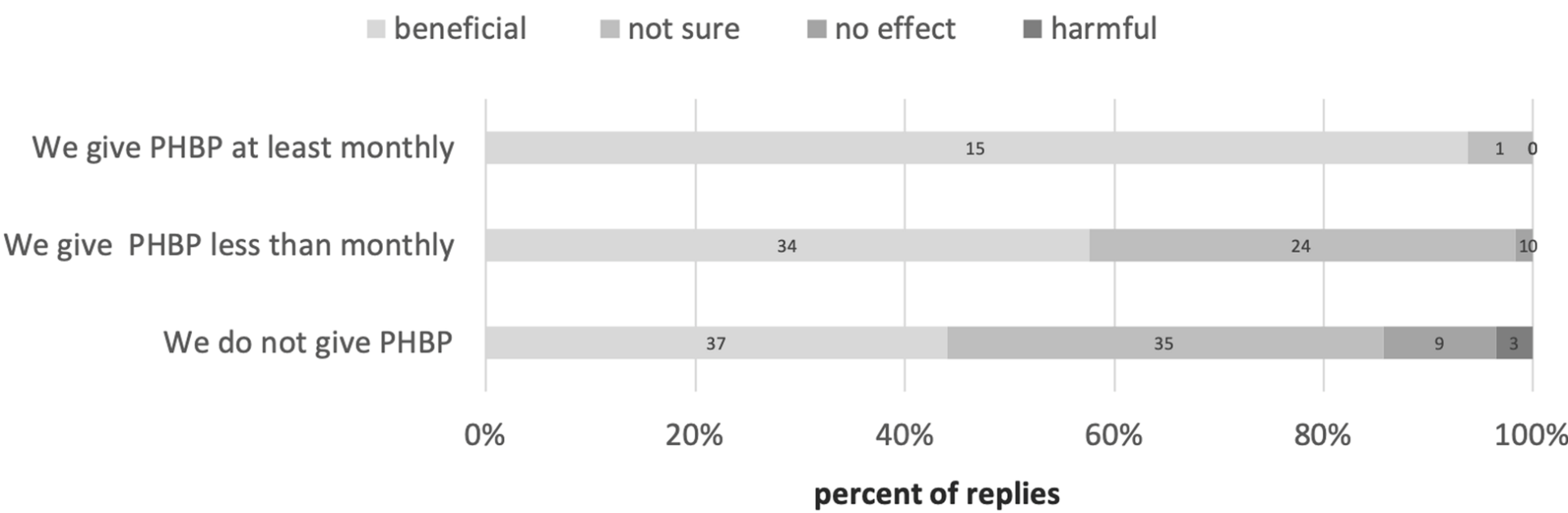
Use of Pre-hospital Blood Products



Overall 72% of the respondents have a formal pre-hospital transfusion policy, with only 38% of the services auditing their transfusion practice.


Which method of warming do you apply?
Blood products are passively warmed to ambient temperature
We don't warm blood products prior to administration
We use a warming device (please specify below)
0
5
10
15
20
25
30
35
40
45
number of replies

Perceived benefit of PHBP



Bichot A, Pasquier P, Martinaud C, et al. Use of prehospital transfusion by French emergency medical services: A national survey. *Transfusion*. 2023;63 Suppl 3:S241-S248

- National SMUR survey
- 48% response
- Of this, 82% carry PHBP
  - 100% RBC, 27% FFP, 7% lyoplas
- No temp monitoring in 52%
- 43% wastage

Objectives

- Where have we come from? ✓
- Where are we now? ✓
- Is where we are any good? ✗
- Where should we heading next?
- How do we get there?

LTOWB

Review Article

Check for updates

Rebirth of the cool: the modern renaissance of low titer group O whole blood for treating massively bleeding civilian patients

Mark H. Yazer[1,2], Jansen N. Seheult[1], Andrew Beckett[3], Darrell J. Triulzi[1,2], Philip C. Spinella[4]

[1]Department of Pathology, University of Pittsburgh, Pittsburgh, PA, USA; [2]Vitalant, Pittsburgh, PA, USA; [3]Department of Surgery, University of Toronto, Toronto, Ontario, Canada; [4]Department of Pediatrics, Division of Critical Care Medicine, Washington University in St Louis, St Louis, MO, USA

PRODUCT	VOLUME OF ADDITIVE SOLUTION (ml)
Plasma	48
Packed Red Cells	118
Apheresis Platelet	35
Whole Blood	70

10 units of RBC, 10 units FFP, 5u Platelets –
1835 ml of citrate, dextrose, phosphate, anticoagulant

10 units of LTOWB –
700 ml of citrate, dextrose, phosphate, anticoagulant

Advantages of Whole Blood

- Simplifies the logistics of the resuscitation by providing a balanced resuscitation fluid in one bag instead of three
- More concentrated product compared to reconstituting whole blood with conventional components
- Provides cold stored platelets that have improved in vitro and perhaps in vivo hemostatic function compared to room temperature platelets in this patient population
- Provides for a longer shelf life for stored platelets compared to room temperature storage
- Provides for the availability of platelets where they might otherwise not have been available
- Reduces the bacterial contamination rate of a platelet-containing product
- Reduces the incidence of ABO mis-transfusion during the resuscitation
- Reduces donor exposures

Clinical Trial > Transfusion. 2020 Jul;60(7):1544-1551. doi: 10.1111/trf.15802.
Epub 2020 Apr 22.

Cold-stored whole blood in a Norwegian emergency helicopter service: an observational study on storage conditions and product quality

Christopher Bjerkvig [1 2 3], Joar Sivertsen [4], Hanne Braathen [4], Turid Helen Felli Lunde [4], Geir Strandenes [4 5], Jörg Assmus [6], Tor Hervig [3 4], Andrew Cap [7], Einar K Kristoffersen [3 4], Theodor Fosse [1 2 3], Torunn Oveland Apelseth [4 8]

Affiliations + expand

PMID: 32319702 DOI: 10.1111/trf.15802


22
LIFESUPPORT

Who

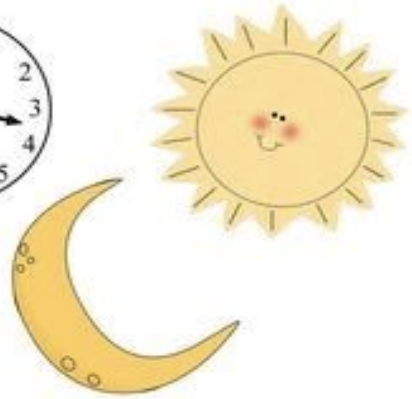
is a person

What

is a thing or an action

When

is a time



Where

is a place

Why

is the reason something happened

How

is a number, or the way something is done

2 or

+

=

Suggestions

- Who – HypoVOLAEMIC patients
- Why – Ongoing bleeding
- Where – En route
- When – Signs of poor end organ perfusion
- What – LTOWB
  - Plasma with PRC to target Hb
- How – Warmed and controlled rate