

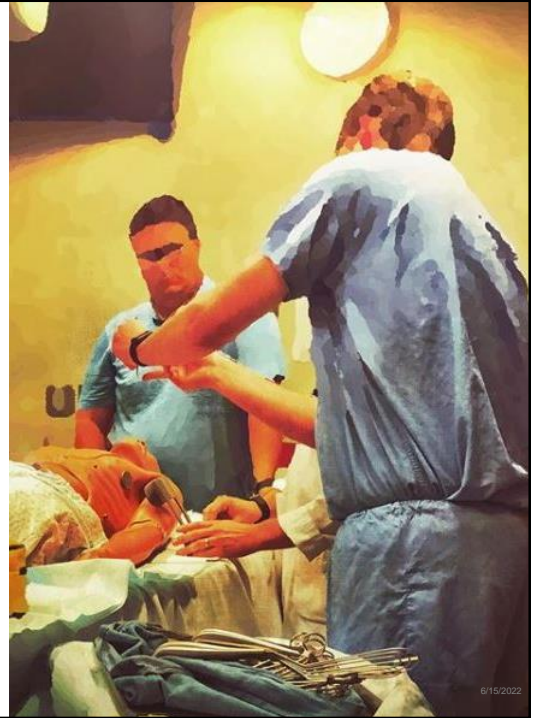


TRAUMA WHOLE BLOOD

BACK TO THE FUTURE...

Justin Kreuter, MD
[@KreuterMD](#)

HAABB Virtual Summer Meeting
June 15, 2022



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DISCLOSURES

None

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LEARNING OBJECTIVES

1. Recognize why whole blood may be used in trauma
2. Summarize what has been learned about using whole blood in trauma
3. Explain practical aspects of transfusing whole blood in trauma
4. Hypothesize where the field of trauma whole blood is headed

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1

RECOGNIZE WHY WHOLE BLOOD MAY BE USED IN TRAUMA



4

COMPONENT TRANSFUSION**WHOLE BLOOD TRANSFUSION**

versus

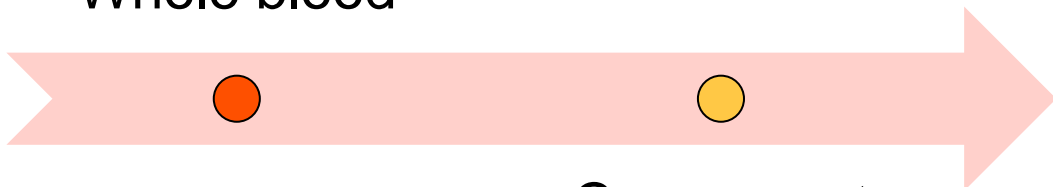
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TRANSFUSION TIMELINE

Whole blood



Component
transfusion

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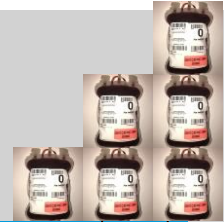
RECENT EVENTS ON THE TRAUMA TIMELINE

2001- present
Military
experience

2013
PROMMTT

2015
PROPPR

2018-2021
LTOWB



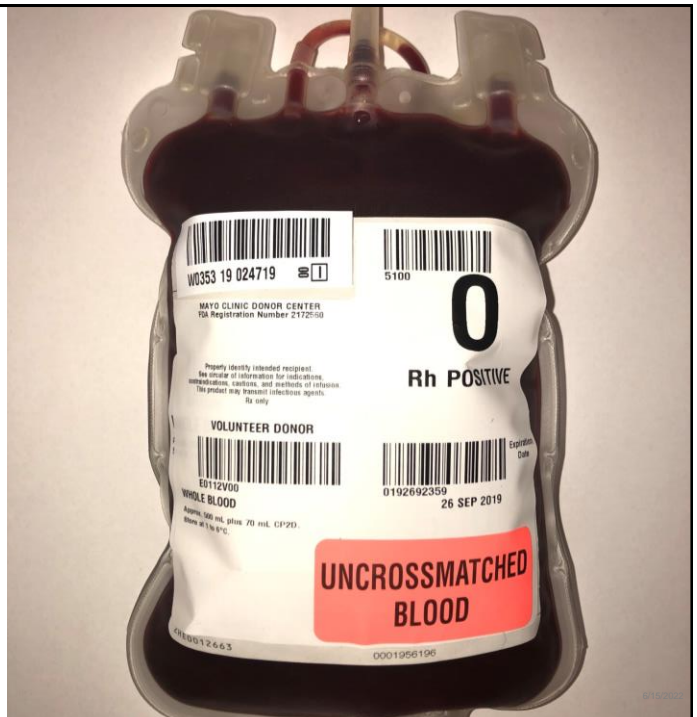
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2

**SUMMARIZE
WHAT HAS
BEEN
LEARNED
ABOUT USING
WHOLE BLOOD
IN TRAUMA**



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TYPES OF WHOLE BLOOD



Cold stored
whole blood



Warm fresh
whole blood

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?UNIVERSAL? WHOLE BLOOD

- Concern over isoagglutinins
 - Anti-A
 - Anti-B



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LOW TITER GROUP O WHOLE BLOOD L.T.O.W.B.

“Based on the published data and clinical experience during decades of conflict, it is our opinion that low-titer group O WB is the preferred alternative for emergency transfusions where safe ABO-identical transfusions cannot be ensured.”

Strandenes et al. SHOCK. 41(supp1):70-5. 2014



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CIVILIAN TRAUMA: SAFETY & FEASIBILITY LTOWB



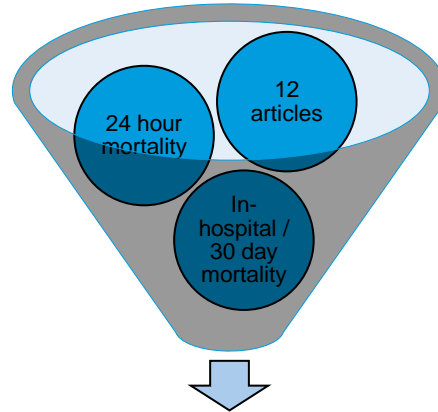
Yazer et al. J Trauma Acute Care Surg. 81(1):21-6. 2016

47 patients
30 non-O patients
2 units LTOWB

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META-ANALYSIS OF WHOLE BLOOD VS. COMPONENT TRANSFUSION



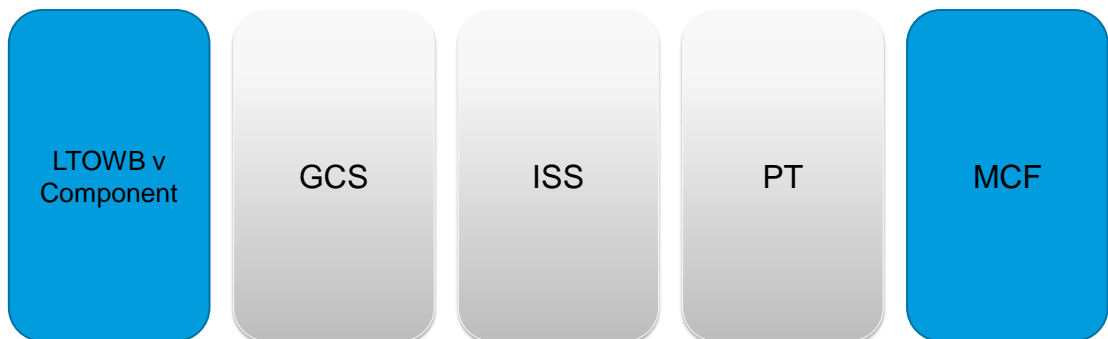
No difference in outcomes

Crowe et al. JACEP. 1:633-41. 2020.

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PROSPECTIVE STUDY: SURVIVAL BENEFIT?

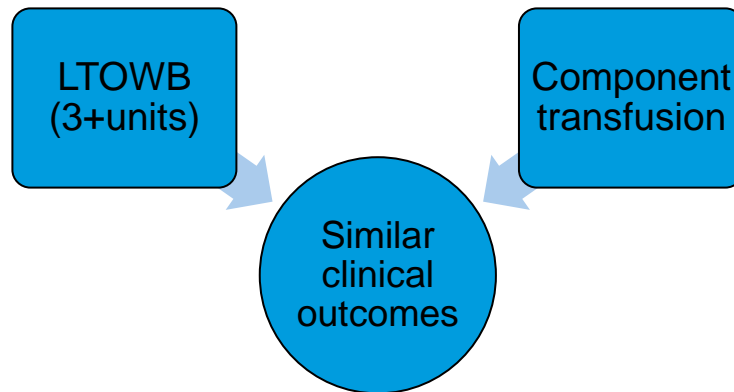


Shea et al. Transfusion. 60 (suppl) S2-9. 2020

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SINGLE-CENTER, RETROSPECTIVE STUDY

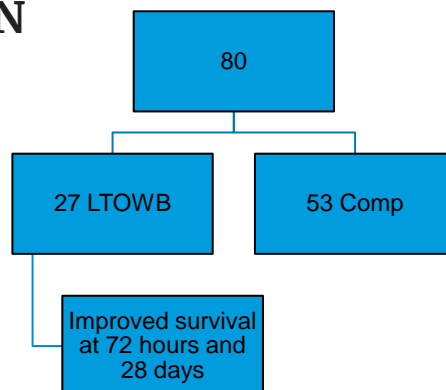


Yazer et al. Transfusion. 1-11. 2021.

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LOW TITER GROUP O WHOLE BLOOD IN INJURED CHILDREN REQUIRING MASSIVE TRANSFUSION

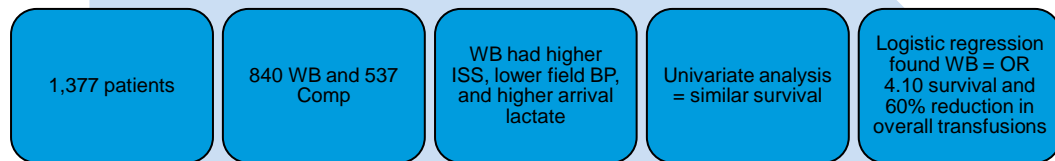


Gaines et al. Ann Surg. epub. 2021.

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IMPACT OF INCORPORATING WHOLE BLOOD INTO HEMORRHAGIC SHOCK RESUSCITATION

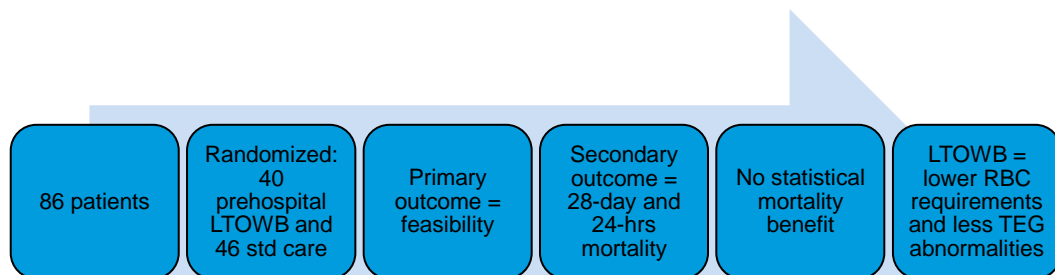


Brill et al. J Am Coll Surg. 234(4): 408-18. 2022.

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PREHOSPITAL LOW TITER GROUP O WHOLE BLOOD



Guyette et al. J Trauma Acute Care Surg. 92(5): 839-47. 2022.

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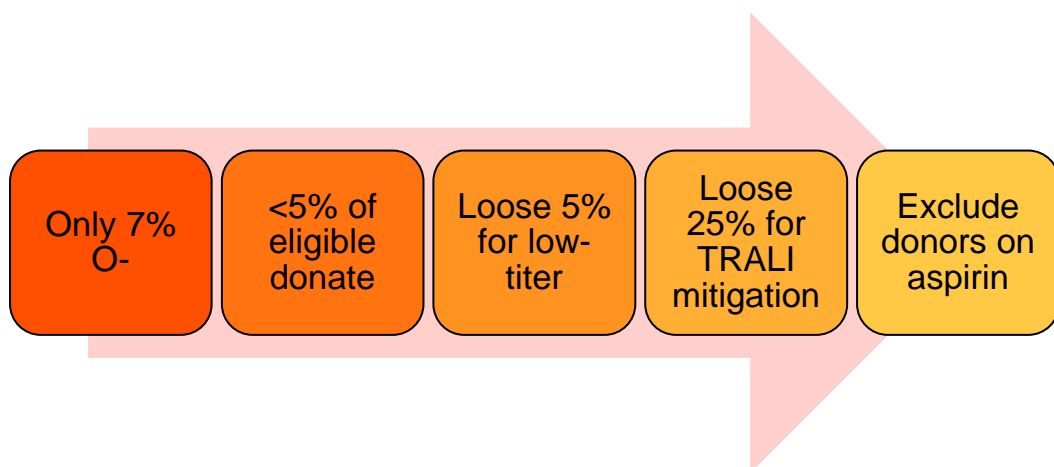
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EXPLAIN PRACTICAL ASPECTS OF TRANSFUSING WHOLE BLOOD IN TRAUMA



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BUILDING AN INVENTORY

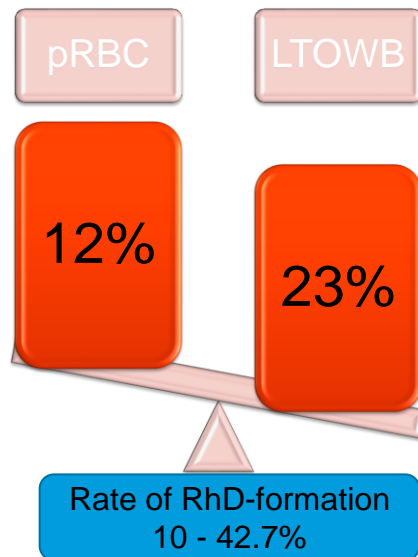


Troughton & Young. Transfusion.1-6.2021.

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STRATEGY FOR RH NEGATIVE LTOWB?



Yazer et al. Hematology. 26(1):321-7.2021.
Troughton & Young. Transfusion.1-6.2021.

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WHAT IS CURRENT PRACTICE? AT LEVEL 1 TRAUMA CENTERS

Use LTOWB?		
43 Yes	14 no, but working on it	46 No

Yazer et al. Transfusion.1-7.2021

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WHAT IS CURRENT PRACTICE? AT LEVEL 1 TRAUMA CENTERS

Max units for adult?

5 no limit	35 1-10 units	3 >10 units, but limited
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Yazer et al. Transfusion.1-7.2021

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WHAT IS CURRENT PRACTICE? AT LEVEL 1 TRAUMA CENTERS

Who gets LTOWB?

9 all massive bleeders	7 selected massive bleeders	27 only trauma patients
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Yazer et al. Transfusion.1-7.2021

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WHAT IS CURRENT PRACTICE? AT LEVEL 1 TRAUMA CENTERS

RhD+ units for young women?

22
yes

21
no

Yazer et al. Transfusion.1-7.2021

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PEDIATRIC USE OF LTOWB AT TOP 17 USERS?

Pediatric use?

7
yes

10
no

Infant; >2yrs; >4yrs; >5yrs;
>15males; >16yrs

Troughton & Young. Transfusion.1-6.2021.

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TO LEUKOREDUCE OR NOT TO LEUKOREDUCE?

- Leukoreduction
 - CMV 'safe'
 - Decreased FNHTR
 - Decreased HLA alloimmunization
- Platelet-sparing filter
 - Cost
 - Reduction in platelet count
 - Retention of platelet function



Fadeyi et al. Transfusion.60:2834-40.2020.

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EDUCATION TRAINING DEBRIEF



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4

**HYPOTHESIZE
WHERE THE
FIELD OF
TRAUMA
WHOLE BLOOD
IS HEADED**



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COMPONENT TRANSFUSION



WHOLE BLOOD TRANSFUSION



versus

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COMPONENT TRANSFUSION**WHOLE BLOOD TRANSFUSION**

AND

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COMPONENT TRANSFUSION**WHOLE BLOOD TRANSFUSION**

AND

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TRAUMA WHOLE BLOOD

LTOWB



Why?

- Bleeding WB
- Convenient



What?

- LTOWB
- Safety
- Feasibility
- Efficacy



How?

- Collaboration
- # of units
- Patients
- Rh-/unkn



If?

- Lessons are true
- Forward deployment of blood

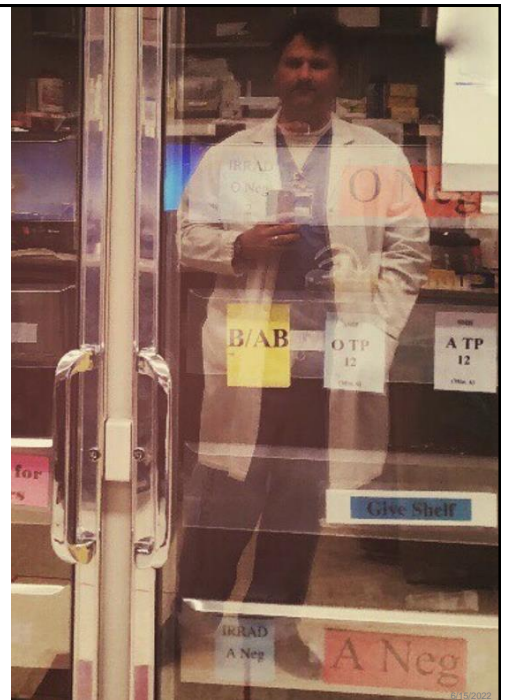
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QUESTIONS & ANSWERS

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