



# Launching a Whole Blood Program at a Level I Trauma Center

Caroline Park, MD, MPH, FACS  
Division of Burn, Trauma and Acute Care Surgery

# Overview

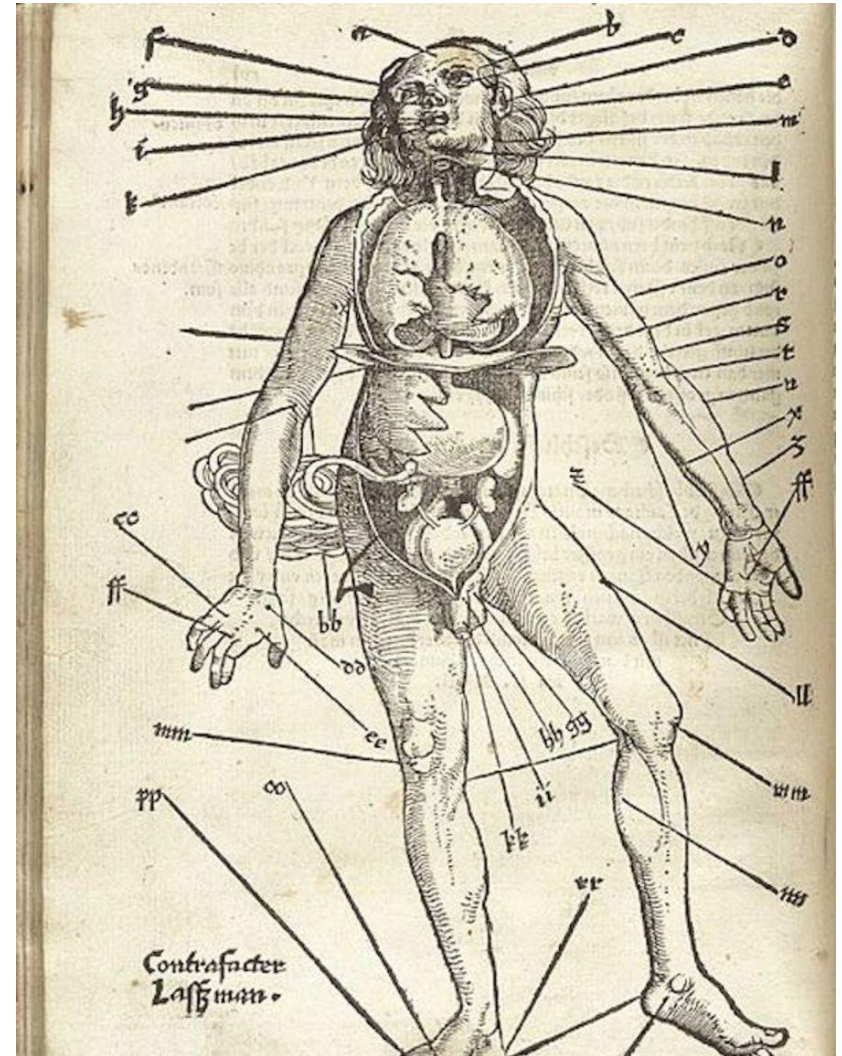


- History of Transfusion
- Military to Civilian transition
- Shift to components
- Back to Whole



# Bloodletting

- 3,000–3,500 BC
- Egypt-> Greece-> Rome



# Phlebotomy as Therapy

- **Humoral Theory:**
- imbalance of 4 humors:
  - Blood
  - Phlegm
  - yellow bile
  - black bile





# Transfusion - Early Foundations

- 1600s–1800s
- 1665 (Lower): first recorded successful blood transfusion (dog->dog)
- 17 to 18th century: animal->human transfusions

# Early Whole Blood Transfusion

---

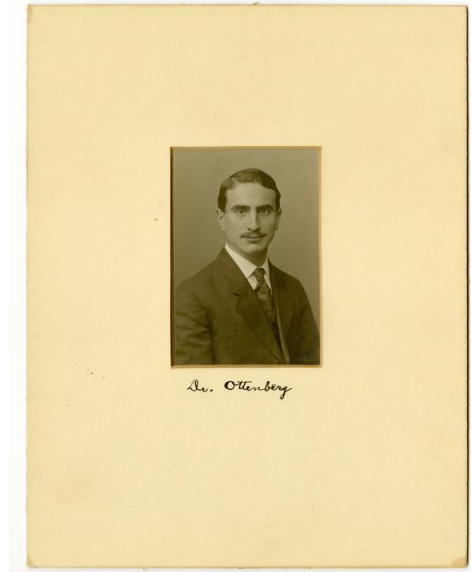
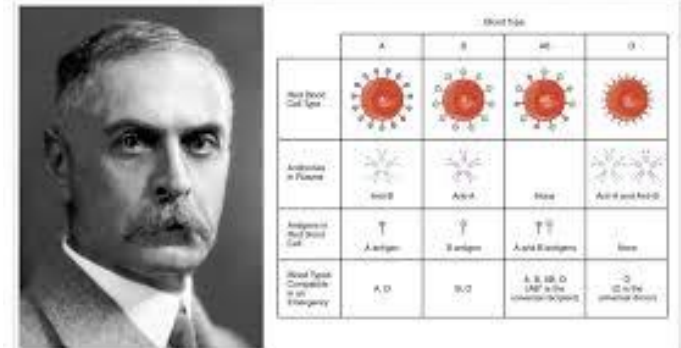


- 19<sup>th</sup> century
- Blundell first human-to-human transfusion
  - Post-partum hemorrhage
- Transfusion of milk
- Creation of saline

# Scientific Breakthroughs

- 1901 – Karl Landsteiner - ABO blood groups
- 1907 – Ottenberg – blood typing and cross-matching
- 1930-40s
  - Rh typing and incompatibility

DR. KARL LANDSTEINER



# World Wars

- 1914–1945
- Blood banks
- Battle-field whole blood use
- Mobile units
- Expansion of Red Cross regional blood centers



W6000-24.—Convoy of postpills used by American Red Cross for controlling blood donors.

# Shift to Components

- 1950s–2000s
- Infection control
- Increased screening
- Increased shelf-life



# Modern Whole Blood

- In trauma, mass casualty events
- In emergency surgery
  - GI bleeds
  - Postpartum hemorrhage
- LTOWB
  - Seroconversion?
- balanced resuscitation
  - Improved monitoring



# Whole Blood: Rekindled



REVIEW ARTICLE

## Whole blood for the acutely haemorrhaging civilian trauma patient: a novel idea or rediscovery?

[M. P. Bahr](#), [M. H. Yazer](#), [D. J. Triulzi](#), [R. A. Collins](#) ✉

First published: 29 June 2016 | <https://doi.org/10.1111/tme.12329> |

[VIEW METRICS](#)

# Cold-stored Whole Blood



2019 WTA PODIUM PAPERS

## Cold-stored whole blood: A better method of trauma resuscitation?

Hazelton, Joshua Paul DO; Cannon, Jeremy W. MD; Zatorski, Catherine MD; Roman, Janika San MPH; Moore, Sarah A. MD; Young, Andrew J. MD; Subramanian, Madhu MD; Guzman, Jessica F. BA; Fogt, Franz MD; Moran, Anna MD; Gaughan, John PhD; Seamon, Mark J. MD; Porter, John MD

[Author Information](#)

*Journal of Trauma and Acute Care Surgery* 87(5):p 1035-1041, November 2019. | DOI: 10.1097/TA.0000000000002471



# Whole Blood Use in Military



THE JOURNAL OF AABB

transfusion.org

# TRANSFUSION

SUPPLEMENT ARTICLE

## Joint Trauma System, Defense Committee on Trauma, Armed Services Blood Program consensus statement blood

[Stacy A. Shackelford](#) ✉, [Jennifer M. Gurney](#), [Audra L. Taylor](#), [Sean Keenan](#), [Jason B. Corley](#), [Cord W. Cunningham](#), [Brendon G. Drew](#), [Shane D. Jensen](#), [Russ S. Kotwal](#) ... [See all author](#)

First published: 16 July 2021 | <https://doi.org/10.1111/trf.16454> | [VIEW METRICS](#)

# Whole Blood Use - Civilian



## Impact of Incorporating Whole Blood into Hemorrhagic Shock Resuscitation: Analysis of 1,377 Consecutive Trauma Patients Receiving Emergency-Release Uncrossmatched Blood Products

Brill, Jason B MD; Tang, Brian BS; Hatton, Gabrielle MD; Mueck, Krislynn M MD; McCoy, C Cameron MD; Kao, Lillian S MD, MS, FACS; Cotton, Bryan A MD, MPH, FACS

[Author Information](#) 

*Journal of the American College of Surgeons* 234(4):p 408-418, April 2022. | DOI: 10.1097/XCS.0000000000000086

# Whole Blood: Resource Utilization



The American Surgeon™



Impact Factor: **0.9** / 5-Year Impact Factor: 1

 Restricted access | Research article | First published online December 15, 2022 | [Request permissions](#) 

## The Use of Whole Blood in Rural Trauma Leads to Decreased Resource Utilization

[Britney R. Niemann, MD](#)  , [Daniel J. Grabo, MD](#), [...], and [James M. Bardes, MD](#)  [View all authors and affiliations](#)

[Volume 89, Issue 12](#) | <https://doi.org/10.1177/00031348221142584>

# Need for Blood: Dallas in the News

## DALLAS

### Fire-Rescue to test program carrying blood on EMS calls

Action comes after News' series on how practice can save lives





# Summary

---

- Whole Blood is back (again)
- Patients bleed all components
- Consider cost, resource utilization
- Prioritize outcomes!

# Launching a Whole Blood Program in a Level I Trauma Center



*Kristie Brown, DNP, APRN, AG/ACNP-BC, FNP-BC, ENP-C*  
*Director of Trauma*



Parkland



## Objectives

- 1. Describe the rationale for implementing a whole blood program at a Level I Trauma Center**
- 2. Identify the regulatory, safety and quality requirements required for whole blood utilization**
- 3. Identify lessons learned and challenges encountered during our first two years of implementation.**



Parkland



## Why Whole Blood Matters

- ♥ □ Hemorrhage is a leading cause of preventable trauma death
- □ □ Early balanced resuscitation improves survival
- □ Whole blood simplifies and accelerates care
- + Civilian adoption is rapidly expanding



# Parkland



## Development

- **Early 2023 began multidisciplinary teams discussions: trauma leadership, transfusion services leadership, blood supply partners, and hospital senior leadership.**
- **Developed a timeline with a Go-Live in October 2023.**
- **Protocol developed and disseminated across all disciplines, MD and RN**
- **Limitations and guidelines for usage were developed**



# Parkland



# Clinical Pathway Development

## Low Titer O Positive Whole Blood Protocol

SUBMITTED/REVIEWED BY: Caroline Park, MD, MPH  
LAST REVIEWED/REVISION DATE: 10/6/2023, 4/3/2024-CP/BB/TS/CE/KB

### Policy Statements

#### 1. Purpose

To provide guidance in adequate and efficient blood and/or products delivery for the resuscitation of a patient with active, and uncontrolled hemorrhage following a traumatic injury.

#### 2. Patient population

Low Titer O Positive Whole Blood (LTOWB) is restricted to patients under the direction of the Trauma Service and located in the trauma bay (Pod M, Emergency Department).

- Low Titer O Positive Whole Blood (LTOWB) MD Protocol
- RN LTOWB Protocol

<b>Trauma Whole Blood Resuscitation – Low Titer Group O Whole Blood (LTOWB)</b>		Published: 12/06/2023
Rees-Jones Trauma Center		Page 1 of 5

### PURPOSE:

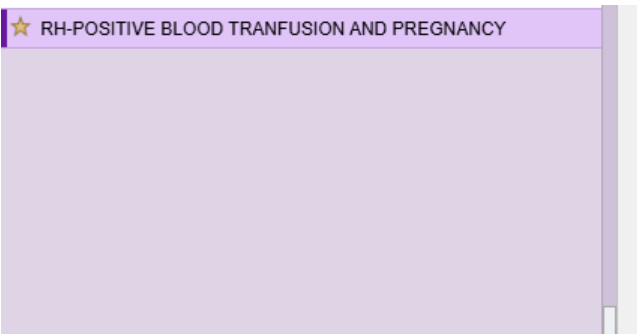
To provide guidance on the use of Low Titer Group O Whole Blood (LTOWB) under the direction of the Trauma Service in the resuscitation of trauma patients who present to the Rees-Jones Trauma Center following traumatic injury.



# Parkland



- In April 2024, an added statement regarding exclusions for LTOWB for patients in cardiac arrest, suggesting futile resuscitation efforts at the trauma attending's discretion.
- Created a letter to given women of child bearing age who are RH- who received LTOWB
- 



Rees-Jones Trauma Center at Parkland Health  
2/24/2026



Subject: Important Information Regarding Rh-Positive Blood Transfusion and Pregnancy



Parkland



# LTOWB Data per NTDB

## Key Metrics

**Total patients: 361**

MTP activations: 151 (41.8%)

LTOWB given: 338 (93.6%)

Overlap (MTP + LTOWB): 128

Crude mortality: 20.2% overall

**85 Total Females**

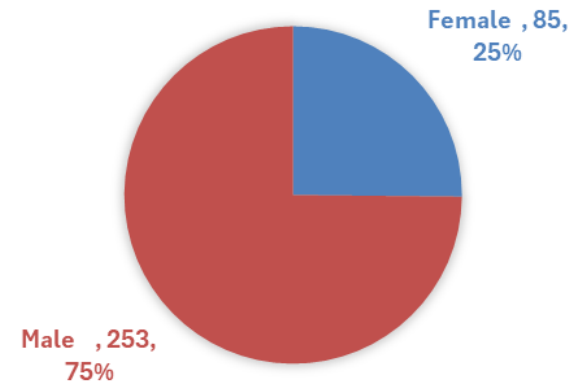
**60 < 55yo**

**25 ≥ 55yo**

## LTOWB w/ or w/o MTP

Count of WHOLE\_BLOOD

### TOTAL LTOWB W/ OR W/O MTP





Parkland



LTOWB Data

**12 total women received LTOWB and are negative or not documented (six are deceased)**

**6 total women with RH Neg blood type (5 of childbearing age)**

- **Of Child-bearing age: 4 ABSC Neg, 1 ABSC Pos**
- **All received further testing and the trauma LTOWB letter. To date, no complications have been reported to the transfusion services or to the trauma service.**