# Utilizing the JTS CPG as the Standard for WBB Operations on Amphibious Platforms

*Adopted from the Joint Trauma System (JTS) Clinical Practice Guideline (CPG) Training Series*

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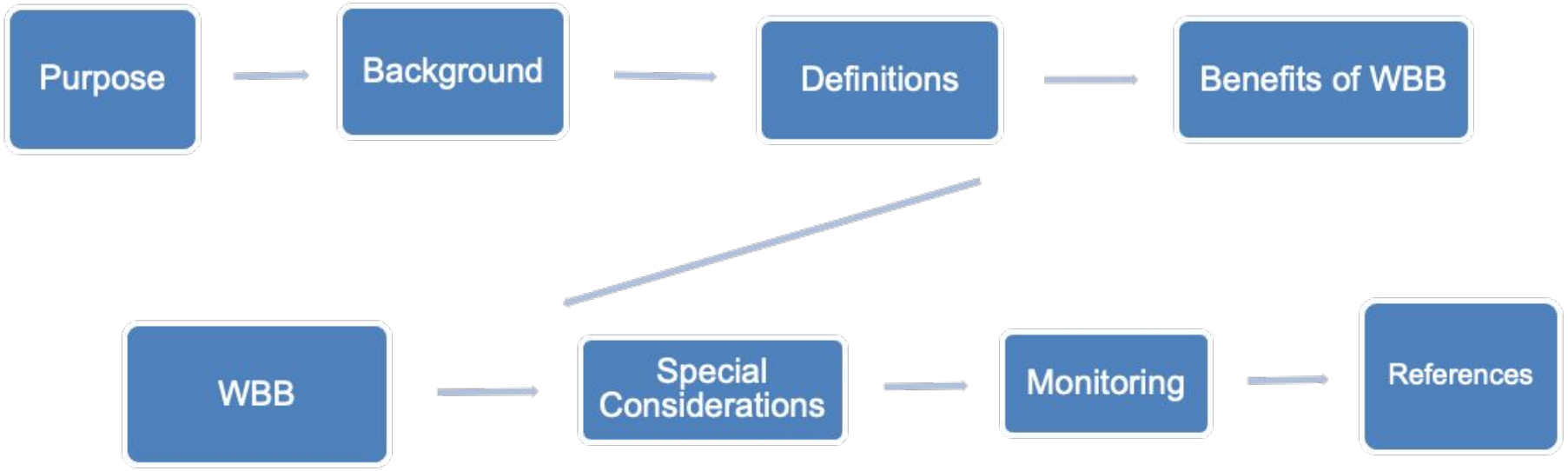
# Roadmap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# Purpose

- Provide education in regards to Whole Blood, Stored Whole Blood, and frozen blood products
- Administration of blood products in austere environments
- Discuss the current JTS CPGs for WB transfusion
- Explore the importance of standardizing WB transfusion via Walking Blood Bank on amphibious platforms

*Presentation is based on the JTS Whole Blood Transfusion CPG, 15 May 2018 (ID: 21).*

# Background- Component Therapy

**WB transfusion to treat hemorrhage results in outcomes that are at least as favorable as expected outcomes with component therapy**

- **Component therapy** (RBC:FFP:platelets) is inferior to WB when administered in a 1:1:1 ratio
  - Disadvantages
    - Requires multiple products
    - Storage demands
    - Dilute blood mixture

Component therapy for a massive transfusion

# Frozen and Deglycerolized RBCs

- Thawing and deglycerolization are time-consuming processes
  - Takes at least 35 minutes to thaw
  - Takes 60 minutes to deglycerolize one unit in ACP 215
- Equivalent to a fresh unit of RBCs
  - Provides the same physiologic benefit as liquid RBCs
- Significantly lower concentrations of proteins & associated with non-hemolytic transfusion reactions

# Background- Whole Blood

**WB provides the most physiologic blood mixture**

- Single product requiring only one storage modality
- Survival is greatest with FWB
- 91% of trauma related deaths are preventable if blood products are administered promptly

*Photo by Lance Cpl. Ashley Lawson, Courtesy of Defense Visual Information Distribution Service.*

# Definition: Fresh Whole Blood

## FWB

- Blood collected on an emergency basis from a “walking blood bank”
- Stored at room temperature and useable within 24 hours
- Stored within 8 hours in appropriate refrigeration ➡ SWB


Walking Whole Blood Bank

*Photo courtesy of Defense Visual Information Distribution Service*

# Definition: Whole Blood

**WB can be transfused as Fresh Whole Blood (FWB) or Stored Whole Blood (SWB)**

- Collected in anticoagulants CPD (21 day use) or CPDA-1 (35 day use) and stored at 1-6°C
- FDA approved when appropriately collected, stored, and tested for transfusion-transmitted disease
- Contains all components of blood products, with smaller volume of anticoagulant, and maintains in-vitro hemostatic capability for 2 weeks in storage

# Definition: Low Titer O Blood

## Low Titer O Blood (LTOWB)

- Patients with low Anti-A and Anti-B antibodies (< 1:256 saline dilution)
- Preferred resuscitation product for the pre-hospital treatment of patients
- Donors should be re-titered every 90 days

# Using Whole Blood

- SWB is the preferred product for resuscitation
  - LTOWB is most commonly collected and used
- SWB or component therapy in appropriate ratio can be used for damage control resuscitation
- FWB should be reserved for casualties with clinically significant shock/coagulopathy when SWB or optimal 1:1:1 therapy is unavailable
  - Component therapy available within an ARG is limited

# Using Whole Blood

- If given WB, patients with an unknown blood group will require LTOWB or group O RBCs for any acute transfusion requirements for 1 month
  - Impossible to definitively identify blood group with field equipment if blood tested after patient receives LTOWB
- Rh negative blood should ideally be given to females of child- bearing age who are Rh negative

# Using LTOWB

- LTOWB or group O red blood cells will be given to patients with an unknown blood group receiving WB
  - Obtaining pre-transfusion blood sample can establish patient's original blood group
  - Once patient receives LTOWB, impossible to definitively identify blood group with field equipment
  - These patients will therefore require LTOWB or group O RBCs for any acute transfusion requirements for up to 1 month after admission

# Fresh Whole Blood Benefits

## Fresh Whole Blood: Benefits

- Used when other blood products cannot be delivered at an acceptable rate to sustain resuscitative efforts
- Absence of degradation in donor performance
- More readily available than SWB

# Whole Blood Risks

## Fresh Whole Blood: Specific Risks

- Increased risk of transfusion-transmitted infections
  - Possible case of transmission of Hepatitis C
- Increased risk of clerical errors
  - 1 fatal case of graft vs host disease
- Unsanitary conditions in field
- Not FDA approved

# Walking Blood Bank

## WBB Program should be established at all forward-deployed medical treatment facilities (MTF)

- WBB used to collect FWB
- Requires identification and pre-screening of donors
- Coordination required with the Blood Bank Program Officer
- Follows specific guidelines for pre-screening of donors and collecting whole blood in only authorized equipment

Preferred donors for FWB are pre-screened.
*Photo by Petty Officer 2nd Class Charles Oki, Courtesy of Defense Visual Information Distribution Service.*

# Walking Blood Bank

## WBB Ideal Donors

- Preferably composed of active duty/guard/reserves and other DoD beneficiaries.
- Fully pre-screened, LTOWB
  - Group-specific donors may be appropriate for group-specific transfusion (e.g., A to A)
  - Group O FWB of unknown titer safer than attempting to match donor-recipient blood group in emergency situations

# Walking Blood Bank

## Decision to use FWB

- Not completely screened to international and national standards
- Consideration of risks and benefits
- Must be thoroughly documented in casualty record
- Inaccuracy of blood type on ID tags are approximately 4%
- Coalition forces are not routinely utilized as donors
- Foreign nationals are used as a last resort

# Walking Blood Bank

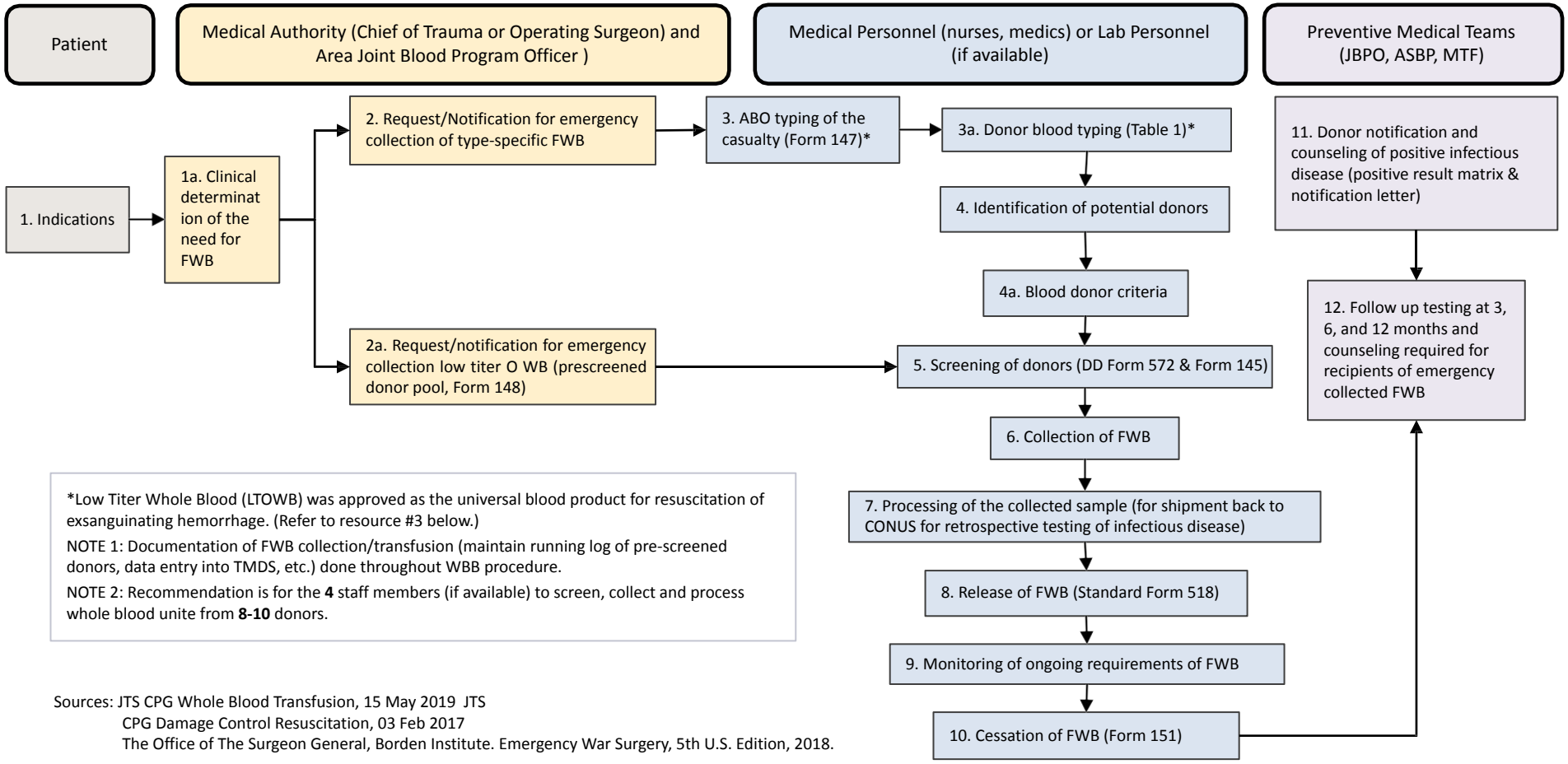
**Theater Medical Data Stores (TMDS) will be used to record donations and disease testing results**

- Prior to issuing FWB, blood type and approved rapid infection disease tests should be performed
- Retrospective samples must be sent to a licensed laboratory for FDA-approved testing regardless of in-theater results
  - Positive infectious disease results require informing the donor and recipient

**Frequency of FWB donation must be tracked**

- WB units should not be collected from donors more frequently than every eight weeks to prevent injury to donor
- 1 unit collected per donor– maximum of 2 in dire situations

# Walking Blood Bank




*Low Titer Whole Blood (LTOWB) was approved as the universal blood product for resuscitation of exsanguinating hemorrhage. (Refer to resource #3 below.)

NOTE 1: Documentation of FWB collection/transfusion (maintain running log of pre-screened donors, data entry into TMDS, etc.) done throughout WBB procedure.

NOTE 2: Recommendation is for the **4** staff members (if available) to screen, collect and process whole blood unite from **8-10** donors.


Sources: JTS CPG Whole Blood Transfusion, 15 May 2019 JTS
CPG Damage Control Resuscitation, 03 Feb 2017
The Office of The Surgeon General, Borden Institute. Emergency War Surgery, 5th U.S. Edition, 2018.

# PI Monitoring

- **Intent (Expected Outcomes)**
  - SWB, particularly LTOWB, is used when available for pre-hospital resuscitation
  - SWB or component therapy is routinely used for damage control resuscitation; FWB is reserved for casualties who meet one of these two criteria:
    1. Patients with clinically significant shock or coagulopathy (e.g., bleeding with associated metabolic acidosis, thrombocytopenia or INR >1.5) when SWB or optimal component therapy (e.g., PLTs and FFP) are unavailable
    2. SWB or component therapy is not adequately resuscitating a patient with immediately life-threatening injuries

# 2017- USS BATAAN AAR

**USS BATAAN received 6 casualties**

- Total of 62 units transfused
  - 12 PRBCs
  - 10 FFP
  - 40 units of FWB

- 2 casualties initially received PRBCs and FFP, but developed coagulopathies
  - FWB products were then administered

# Summary

- WB, and in particular, LTOWB, is the preferred resuscitation product for the pre-hospital treatment of patients in hemorrhagic shock

- FWB should be reserved for casualties, when SWB or optimal component therapy is unavailable, or stored component therapy is not adequate

- July 2021 Update recommends the use of WB over component therapy when available

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