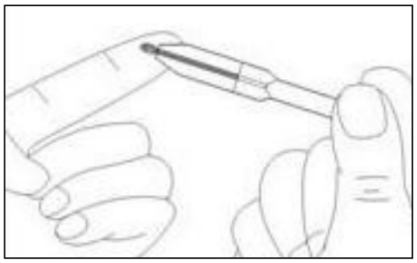
Hemoglobin Assessment

Indications	Equipment Needed
Trauma or medical patient with suspected blood loss	CLIAwaived photometer, alcohol swab, gauze pad, lancet, Capillary Transfer Tube, Test cartridges

Procedure

1. Make sure the meter is ready for use. Turn meter on, and when the on-screen display indicates, insert the testing strip all the way in.
2. Cleanse site for capillary puncture using alcohol pad and allow to dry.
3. Lance side of fingertip. Blot away first drop of blood.
4. Press gently once again to get a 2nd drop of blood.
5. Place the tip of the capillary collection tube against the drop of blood. **DO NOT squeeze capillary collection tube.**
6. Allow capillary collection tube to draw up blood to the level of the black line.
7. Apply blood sample to the specimen area on the test strip. It should fill the entire test area with blood.
8. The meter will then read hemoglobin and hematocrit values.
9. Document findings in PCR. Dispose of microcuvette and lancet into sharps container.



Pearls

- The meter requires a code chip packaged with each box of testing strips. This chip must be inserted on the left hand side of the meter in slot provided.
- Only capillary blood may be tested. Do not use arterial or venous blood.
- Samples should be immediately tested.
- Hematocrit values will not display if hemoglobin values are outside of the range 12.3–17.5 g/Dl.
- Meter will read LO if test result is < 4.5 g/Dl OR if insufficient blood was applied. Repeat test before making treatment decisions based on result.
- Meter will read HI if test result is > 25.6 g/Dl.
- Do not use bleach or alcohol to clean meter sensor area; these will damage the sensor.
- Expected values:
    - Adult males: 13-18 g/Dl
    - Adult females: 11-16 g/Dl
    - Children: 11-16 g/Dl
    - Infants (post-natal): 10-14 g/dL

Error Codes and Troubleshooting

DISPLAY	CAUSE	SOLUTION
E-1	Sensor area is damaged, dirty, or blocked.	Ensure sensor area is clean. Use a soft cotton gauze pad or cotton applicator to clean if necessary. Restart meter.
E-2	Test cartridge was removed during the test.	Repeat the test. Ensure the test cartridge remains in place.
E-3	Specimen was applied to the test cartridge too soon.	Repeat test. Wait for the blood drop symbol before applying specimen
E-4	Batteries are too low.	Replace batteries
E-5	Insufficent specimen	Repeat test, and apply enough blood.
E-6	Expired test cartridge OR date programmed on meter incorrectly.	Check test cartridge expiration date printed on canister label. Set up meter again with correct date.
E-7	Code chip was removed during testing	Confirm chip code matches test strips (see canister label) and insert code chip again.

Blood Product Administration—Adult

Indications	Equipment Required	Assessment Requirements
Trauma or medical patient with suspected blood loss. Must be at least 12 years old. Must have **two or more** of the following: • HR > 120 bpm • Sys. BP ≤ 90 mmHg • Penetrating injury or significant blunt traumatic injury • Hemoglobin of 7 or less	100 mL normal saline Blood-Y tubing IV Catheter ≥ 20 ga. X 2 Buddy Lite Warmer and disposable circuit H & H Meter **PRBCs** and **Liquid Plasma**	Blood pressure, cardiac monitoring, ETCO2 monitoring. Pre- and post-administration VS including GCS H & H (as applicable) Temperature Monitoring

Procedure

1. A person meeting the criteria may refuse the blood transfusion for religious, social, or personal reasons if he/she is awake, alert and oriented. The reason for refusal must be clearly documented in the PCR.
2. In the case of a refusal of blood transfusion, administer Plasmalyte according to protocol
3. Establish two IV access sites with at least a 20 ga. Catheter. Connect directly to a Blood Y administration set with Plasmalyte as base fluid.
4. Ensure IV line patency by flushing site with 10 ml of NS
5. **Record baseline vital signs.**
6. Perform H & H, if available, and record in PCR (do not delay blood product administration)
7. Two (2) EMS personnel must confirm the tag and blood product match including number, blood type, Rh factor, and expiration date. Document tag number and personnel in PCR.
8. Attach wristband to patient.
9. Gently agitate PRBCs and liquid plasma to ensure adequate flow rates.
10. The Qinflow Warrior blood warmer is not FDA approved for use with liquid plasma; use the Buddy Lite warmer system. **DO NOT administer cold blood.** Always route blood products through a warmer circuit.
11. Administer Plasma (1 unit) through blood Y through primed Buddy Lite IV warmer circuit. The initial infusion rate will be slow to observe for Transfusion Reaction. If no reaction is noted, flow wide open repeat in pairs with PRBC as necessary.
12. Administer PRBC (1 unit) through blood Y, flow wide open through primed Buddy Lite IV warmer circuit, The initial infusion rate will be slow to observe for Transfusion Reaction. If no reaction is noted, flow wide open repeat in pairs with Plasma as necessary.
13. Consider using a pressure infusion device.

Pearls

- Watch for transfusion reaction; if present, stop transfusion, change all lines and utilize normal saline. Bag blood products for return to blood bank, and if necessary, treat with **Allergic Reaction** guidelines.
- Transfusion Reaction is defined as an adverse event experienced by a patient in association with a transfusion that is not explained by the patient's underlying condition.
    - If signs and symptoms of a Transfusion Reaction occur STOP the transfusion immediately. Begin Plasmalyte infusion through new tubing at the desired rate and refer to Allergic Reaction & Anaphylaxis guidelines
    - The blood product unit, filter, tubing and IV solution bag need to be submitted to the clinical department.
- If only one line can be started, administer Plasma first, followed by PRBC.
- If blood products are readily available, minimize crystalloid fluid administration. If necessary, administer Plasmalyte fluid boluses to maintain *permissive hypotension* prior to blood product availability.
- Continue infusions until resuscitation reaches permissive hypotension range (systolic 70 mmHg for uncontrolled hemorrhage; 90 mmHg for controlled).
- Prime IV warmers with 10cc of Plasmalyte prior to starting blood product.
- If giving medications, use the plasma site, stop flow, flush with 10cc of NS, give medications, flush with another 10cc of NS, then resume plasma flow. Consider establishing third IV site with lock for medications.
- If only one IV line is established and PRBC's are being infused and you need to administer a medication, use the PRBC site, stop flow, flush with 10cc of NS, give medications, flush with another 10cc of NS, then resume PRBC flow.
- Blood products may be administered through an IO.
- Do NOT mix medications with Blood Products in the bag
- Do not delay transport to initiate blood products. Initiate en route if patient is unstable/urgent.
- Notify receiving facility about blood transfusion early.
- Trauma patients receiving blood products should be transported to a Level I or Level II Trauma Center. If this is unavailable, proceed to the next highest level trauma center available.
- Medical patients receiving blood products should be transported to the closest most appropriate facility.

Mandatory Documentation

- Blood Pressure, Pulse, ETCO2, SPO2 and GCS pre and Post Whole Blood Product administration.
- Patient Demographics- Age Sex any comorbidities or other risk factors
- Time of Injury to Time that Whole Blood infusion initiated. (Goal is less than 36 minutes from injury to WB administration)
- Number of units transfused.
- Complete any additional supplemental reports that are required.
- Completion of PCR with Supervisor review prior to call closing.

Blood Product Administration—Pediatric

Indications	Equipment Required	Assessment Requirements
Trauma or medical patient with suspected blood loss. Pediatric patients 1 - 11 years old Must have two or more of the following: • HR > 150 bpm (age dependent) • Sys. BP ≤ 70 + child's age in years x 2 • Penetrating injury or significant blunt traumatic injury • Hemoglobin of 7 or less	100 mL normal saline Blood-Y tubing IV Catheter ≥ 22 ga. X 2. Fluid warmer (BuddyLite or QinFlow Warrior) H & H Meter **PRBCs** and **Liquid Plasma**	Blood pressure, cardiac monitoring, ETCO2 monitoring. Pre- and post-administration VS including GCS H & H (as applicable) Temperature Monitoring

Procedure

1. A person meeting the criteria whose parents/guardians refuse the blood transfusion for religious, social, or personal reasons if he/she is awake, alert and oriented. The reason for refusal must be clearly documented in the PCR.
2. In the case of a refusal of blood transfusion, administer Plasmalyte according to protocol
3. Establish two IV access sites with at least a 22 ga. Catheter. Connect using an extension set with Plasmalyte. Consider using a Buretrol to control fluid administration.
4. Ensure IV line patency by flushing site with 10 ml of NS
5. **Record baseline vital signs.**
6. Perform H & H, if available, and record in PCR (do not delay blood administration).
7. Two (2) EMS personnel must confirm the tag and blood product match including number, blood type, Rh factor, and expiration date. Document tag number and personnel in PCR.
8. Attach wristband to patient.
9. Gently agitate PRBCs and liquid plasma to ensure adequate flow rates.
10. The Qinflow Warrior blood warmer is not FDA approved for use with liquid plasma; use the Buddy Lite warmer system. **DO NOT administer cold blood.** Always route blood products through a warmer circuit.
11. Administer Plasma up to 10 mL/kg through blood Y through primed Buddy Lite IV warmer circuit.
12. The initial infusion rate should be slow to observe for Transfusion Reaction. If no reaction is noted, flow wide open repeat in pairs with PRBC as necessary.
13. Administer PRBC up to 10 mL/kg through blood Y, flow wide open through primed Buddy Lite IV warmer circuit.
14. The initial infusion rate should be slow to observe for Transfusion Reaction. If no reaction is noted, flow wide open repeat in pairs with Plasma as necessary.
15. Carefully monitor flow rates and volumes administered to avoid accidentally administering too much volume to the patient.

16. Administer Plasma/PRBC in 50 mL boluses, titrated to *permissive hypotension*.
17. If only one IV is available, alternate Plasma and PRBC boluses in pairs.
18. Continually monitor the patient's vital signs (temperature) and watch for signs of Transfusion Reaction
19. Empty blood product containers should be properly disposed of in a biohazard container

Pearls

- Watch for transfusion reaction; if present, stop transfusion, change all lines and utilize normal saline. Bag blood products for return to blood bank, and if necessary, treat with Allergic Reaction guidelines.
- Transfusion Reaction is defined as an adverse event experienced by a patient in association with a transfusion that is not explained by the patient's underlying condition.
    - If signs and symptoms of a Transfusion Reaction occur STOP the transfusion immediately. Begin Plasmalyte infusion through new tubing at the desired rate and refer to Allergic Reaction & Anaphylaxis guidelines
    - The blood product unit, filter, tubing and IV solution bag need to be submitted to the Clinical Department.
- If only one line can be started and whole blood is not available, administer Plasma first, followed by PRBCs.
- Blood products may be administered through a patent IO.
- If blood products are readily available, minimize crystalloid fluid administration. If necessary, administer Plasmalyte fluid boluses to maintain *permissive hypotension* prior to blood product availability.
- Continue infusions until resuscitation reaches permissive hypotension range (systolic 70 mmHg + age in years x 2) for uncontrolled hemorrhage; (90 mmHg + age in years x 2) for controlled.
- Prime IV warmers with Plasmalyte prior to starting blood product.
- If giving medications, use the Plasma site, stop flow, flush with 10cc of NS, give medications, flush with another 10cc of NS, then resume Plasma flow. Consider establishing third IV site with lock for medications.
- If only one IV line is established and PRBC's are being infused and you need to administer a medication, use the PRBC site, stop flow, flush with 10cc of NS, give medications, flush with another 10cc of NS, then resume PRBC flow.
- Do NOT mix medications with Blood Products in the bag
- Do not delay transport to initiate blood products. Initiate en route if patient is unstable/urgent.
- Notify receiving facility about blood transfusion early.
- Trauma patients receiving blood products should be transported to Memorial Hermann Texas Medical Center. If unavailable, proceed to Texas Children's Hospital or Ben Taub Hospital.

Mandatory Documentation

- Blood Pressure, Pulse, ETCO2, SPO2 and GCS pre and Post Whole Blood Product administration.
- Patient Demographics- Age Sex any comorbidities or other risk factors
- Time of Injury to Time that Whole Blood infusion initiated. (Goal is less than 36 minutes from injury to WB administration)
- Number of units transfused.
- Complete any additional supplemental reports that are required.
- Completion of PCR with Supervisor review prior to call closing.

Buddy Lite Fluid Warmer

Indications	Equipment Needed
Provide warm fluids and warm blood products	• Buddy Lite Warmer • Disposable Buddy Lite circuit

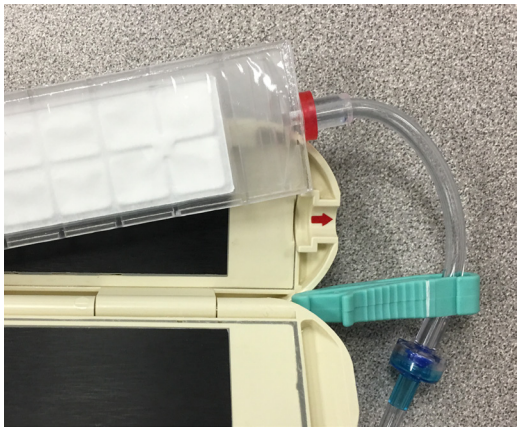
Indications

Used to administer warm IV fluids or blood products.

Contraindications

- Hypothermia

Application Procedure

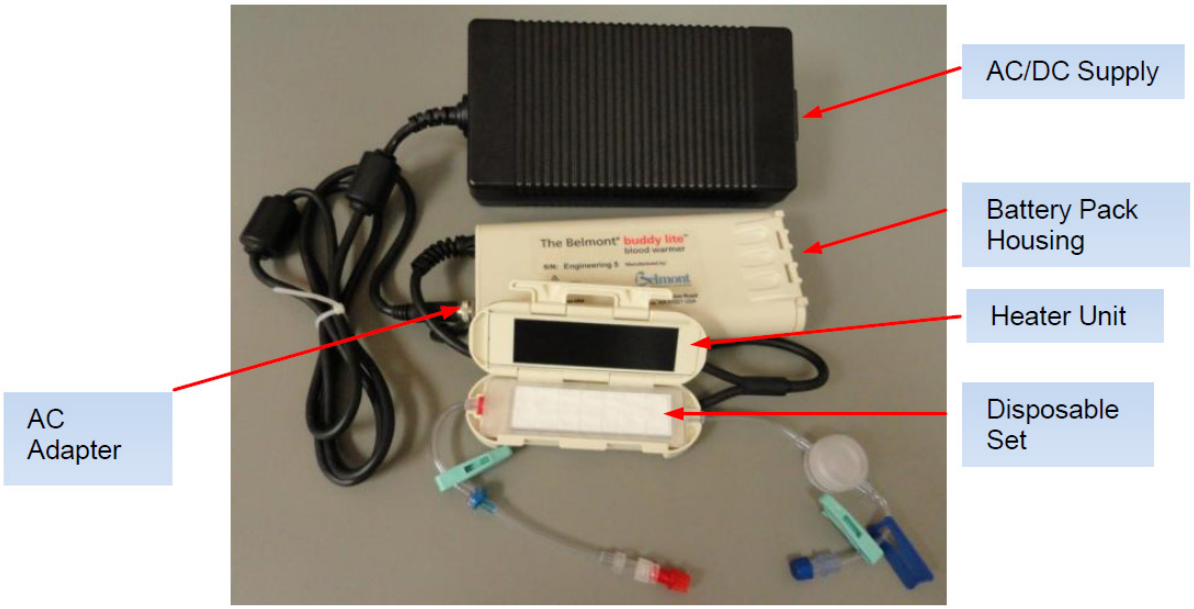


1. Remove disposable portion of circuit from package, open heater, and install circuit in heater (Red ring on circuit lines up with red marking on heater as shown in **Figure 1** to right).
2. Align orientation notches on device with pins on the heater unit
3. Close latch and heater case
4. Attach fluid via administration set to the disposable luer fitting with blue slide clamp
5. Prime the unit with normal saline or Plasmalyte-A, ensuring no visible air bubbles, tapping on the heater unit to ensure no air bubbles
6. Turn on heater unit
7. The BLUE LED turns on and red flashes once (if not the device is not working properly)
8. Attach male luer fitting to the extension set and adjust roller clamps to desired flow rate
9. Secure the system at or below the level of the insertion site
10. Monitor device and make corrections as needed

Pearls

- Use only Plasmalyte-A, Normal Saline, or anticoagulated blood in the device. Lactated Ringers may not be mixed with blood products in this heater device.
- Consider covering battery pack housing with a plastic bag to limit body substance contamination.
- Best infusion rates for heated fluids
    - Chilled fluids 50 ml/minute
    - Room Temp fluids 80 ml/minute
    - Pressure bag may be used, do not inflate over 280 mmHg

Illustrations



Complete system (with attached AC adaptor)

QinFlow Warrior Blood/IV Fluid Warmer

Indications	Equipment Needed
The QinFlow Warrior may be used to rapidly warm IV fluids and/or blood products to a set temperature of 100.4°F within seconds	The components of the QinFlow Warrior Device: • Base Unit (electronic component; connects to power source; user indicator screen; ON/OFF switch • Rechargeable Battery • Disposable Unit (sterile, Styrofoam, single patient use); must plug into base unit • Mounting Unit • Other components: charging cable, charging adaptor, power cord, case

Procedure:

1. Spike IV fluid bag with Blood Y tubing; prime line to clear air
2. Connect battery to base unit
3. Lock battery in place with side latches
4. Open disposable unit and connect to base unit **by cable** (the Styrofoam unit does not need to seat directly on the base-it can be placed closer to the patient by extending the connecting cable)
5. Connect IV tubing to inlet luer on the disposable unit
6. Prime the IV line to flush all of the air out of the line ***DO NOT CONNECT TO PATIENT UNLESS FLUSHED****
7. Connect the outlet luer on the disposable unit to the patient's saline lock
8. Turn on system
    a. The system will initialize
    b. Fluids will warm to 100.4° F / 38° C within a few seconds
    c. Confirm temperature on screen
9. Set IV flow rate via the roller clamp. ***Recommended flow rate is 160-180ml/min**** *(can deliver 200-290ml/min and will support a pressure bag of 300mmHg)*

The system works on gravity; it is NOT A PUMP!

Troubleshooting:

Common Error Codes include:

"Change in Flow" – usually due to air in line; make sure line is clear, but will often clear on its own

"Battery Low" – indicates that the battery is at 30% and can only infuse 1 more liter fluid

"Fluid is HOT" – usually due to air flow/fluid flow irregularities (changes in flow rate); if it doesn't clear on its own then switch out the disposable unit

"Malfunction" – almost always due to not priming the line; turn off unit, disconnect, flush line, restart

NO DISPLAY – check to make sure the unit is powered ON or switch out battery

*****Always watch the LCD display as not all errors will have an audible beep*****

To check the Base Unit is properly communicating with the Disposable Unit (i.e., in case the system is not heating the fluid/blood), use the **"Self-Test"** feature by pressing the green pushbutton for 3 seconds.

In "Self-Test" mode the blood or fluid flows through the system but is not warmed

Device Maintenance

Charging:

- Attach charging adaptor to battery in order to connect to the charger; plug charger into the wall outlet
- Allow batteries to FULLY charge (an empty battery will take 4-5 hours to charge)
- Charge stored batteries every 3 months

Cleaning:

- Wipe down non-disposable parts with Cavi wipes; do not saturate unit
- Place disposable unit in biohazard receptacle

PEARLS:

- Whole blood products will separate during storage and should be gently mixed prior to infusion in order to ensure flow rates.
- A single battery will deliver 3-5 liters of warmed fluid/blood product; ***battery life is not TIME dependent, it is VOLUME dependent*** *(3-5 L may be infused over 30 minutes or 3 hours…the battery will be depleted when the max volume is reached)*
- **Do NOT push ANY medications through the system**
- The device may be placed horizontally or vertically
- You do not have to replace the disposable unit when replacing the blood or fluid bag
- You do not have to shut off the unit when replacing the fluid bag
- You can administer several fluid bags using the same disposable unit (single patient use only)

Whole Blood Administration—Adult

Indications	Equipment Required	Assessment Requirements
Trauma or medical patient with suspected blood loss. Must be at least 12 years old. Must have **two or more** of the following: • HR > 100 bpm with suspected blood loss • Sys. BP ≤ 100 mmHg • Penetrating injury or significant blunt traumatic injury • Hemoglobin of 7 or less	100 mL normal saline Blood-Y tubing IV Catheter ≥ 20 ga. X 2 Quin Flo Warmer and disposable circuit H & H Meter Low Titer Group O Whole Blood (gender dependent)	Blood pressure, cardiac monitoring, ETCO2 monitoring. Pre- and post-administration VS including GCS H & H (as applicable) Temperature Monitoring

Purpose

- Whole blood replaces fluid volume, hemoglobin, plasma proteins, platelets, and clotting factors lost due to hemorrhage. Whole blood can improve perfusion, oxygen delivery, and hemorrhage control.
- Emergency mass transfusion of uncrossmatched blood products has a risk for minor transfusion reactions; low-titer whole blood has the lowest risk and type O has universal type compatibility.
- The Rh-factor (negative or positive) does not have to be a direct match for emergency transfusions, however, if an Rh-negative female patient receives Rh-positive blood, they can develop antibodies leading to potential complications during pregnancy.
- Select **O-positive whole blood** for all males and females > 50 years old and of non-child bearing age.
- Select **O-negative whole blood** for pediatric patients ages 1–18 and for females < 50 years old or of child-bearing age.

Procedure

1. A person meeting the criteria may refuse the blood transfusion for religious, social, or personal reasons if he/she is awake, alert and oriented. The reason for refusal must be clearly documented in the PCR.
2. In the case of a refusal of blood transfusion, administer Plasmalyte according to protocol
3. Establish two IV access sites with at least a 20 ga. Catheter. Connect directly to a Blood Y administration set with Plasmalyte as base fluid if delay is blood is imminent. If WB is readily available minimize clear fluid administration. Use the WB as the resuscitation replacement for the loss.
4. Ensure IV line patency by flushing site with 10 ml of NS
5. **Record baseline vital signs.**
6. Perform H & H, if available, and record in PCR (do not delay blood product administration)

7. Two (2) EMS personnel must confirm the tag and blood product match including number, blood type, Rh factor, and expiration date. Document tag number and personnel in PCR.
8. Both personnel must sign blood component tag.
9. Attach wristband to patient.
10. As protocol allows, consider 1 gram of IV Tylenol to avoid Pyretic Blood transfusion responses.
11. Gently agitate whole blood to ensure adequate flow rates.
12. Connect whole blood primed QinFlow Warrior warmer circuit and utilize a pressure infuser.
13. Administer whole blood in 50 mL boluses up to 10 mL/kg. **DO NOT ADMINISTER COLD BLOOD.**
14. The initial infusion rate should be slow to observe for Transfusion Reaction. If no reaction is noted, flow wide open, continually monitoring VS panel for response to therapy or untoward reactions.
15. As available and approved by Protocol administer 1 gram Calcium Chloride or 1 gram Calcium Gluconate upon completion of the first unit of Whole Blood.

Pearls

- Watch for transfusion reaction; if present, stop transfusion, change all lines and utilize normal saline. Bag blood products for return to blood bank, and if necessary, treat with **Allergic Reaction** guidelines.
- Transfusion Reaction is defined as an adverse event experienced by a patient in association with a transfusion that is not explained by the patient's underlying condition.
    - If signs and symptoms of a Transfusion Reaction occur STOP the transfusion immediately. Begin Plasmalyte infusion through new tubing at the desired rate and refer to Allergic Reaction & Anaphylaxis guidelines
    - The blood product unit, filter, tubing and IV solution bag need to be submitted to the clinical department.
- If giving medications, use the WB site, stop flow, flush with 10cc of NS, give medications, flush with another 10cc of NS, then resume flow. Consider establishing third IV site with fluid or lock for medications.
- If blood products are readily available, minimize crystalloid fluid administration. If necessary, administer Plasmalyte fluid boluses to maintain *permissive hypotension* prior to blood product availability.
- For additional medication therapies consider the initiation of a second venous site.
- Whole blood may be administered through a patent IO.
- Continue infusions until resuscitation reaches permissive hypotension range (systolic 70 mmHg for uncontrolled hemorrhage; 90 mmHg for controlled). The resuscitation goal is to reach a SBP at or near 100 mm Hg
- Prime IV warmers with 10cc of Plasmalyte or NS prior to starting blood product.
- Do NOT mix medications with Blood Products in the bag
- Do not delay transport to initiate blood products. Initiate en route if patient is unstable/urgent.
- Notify receiving facility about blood transfusion early.
- Trauma patients receiving blood products should be transported to a Level I or Level II Trauma Center. If this is unavailable, proceed to the next highest level trauma center available.
- Medical patients receiving blood products should be transported to the closest most appropriate facility.

Mandatory Documentation

- Blood Pressure, Pulse, ETCO2, SPO2 and GCS pre and Post Whole Blood Product administration.
- Patient Demographics- Age Sex any comorbidities or other risk factors
- Time of Injury to Time that Whole Blood infusion initiated. (Goal is less than 36 minutes from injury to WB administration)
- Number of units transfused.
- Complete any additional supplemental reports that are required.
- Completion of PCR with Supervisor review prior to call closing.

Whole Blood Administration—Pediatric

Indications	Equipment Required	Assessment Requirements
Trauma or medical patient with suspected blood loss. Pediatric patients 1 - 18 years old Must have two or more of the following: • HR > 130 bpm (age-dependent) • Sys. BP ≤ 70 + child's age in years x 2 • Penetrating injury or significant blunt traumatic injury • Hemoglobin of 7 or less	100 mL normal saline Blood-Y tubing IV Catheter ≥ 22 ga. X 2. QinFlow Warrior fluid warmer H & H Meter **O negative Whole Blood**	Blood pressure, cardiac monitoring, ETCO2 monitoring. Pre- and post-administration VS including GCS H & H (as applicable) Temperature Monitoring

Purpose

- Whole blood replaces fluid volume, hemoglobin, plasma proteins, platelets, and clotting factors lost due to hemorrhage. Whole blood can improve perfusion, oxygen delivery, and hemorrhage control.
- Emergency mass transfusion of uncrossmatched blood products has a risk for minor transfusion reactions; low-titer whole blood has the lowest risk and type O has universal type compatibility.
- Select **O-negative whole blood** for pediatric patients ages 1–18.

Procedure

1. A person meeting the criteria whose parents/guardians refuse the blood transfusion for religious, social, or personal reasons if he/she is awake, alert and oriented. The reason for refusal must be clearly documented in the PCR.
2. In the case of a refusal of blood transfusion, administer Plasmalyte according to protocol
3. Establish IV access site with at least a 22 ga. Catheter. Connect directly to a Blood Y administration set. Consider using a Buretrol to control fluid administration.
4. Ensure IV line patency by flushing site with 10 ml of NS
5. **Record baseline vital signs.**
6. Perform H & H, if available, and record in PCR (do not delay blood administration).
7. Two (2) EMS personnel must confirm the tag and blood product match including number, blood type, Rh factor, and expiration date. Document tag number and personnel in PCR.
8. Attach wristband to patient.
9. As protocol allows, consider 15 mg of IV Tylenol to avoid Pyretic Blood transfusion responses.
10. Gently agitate whole blood to ensure adequate flow rates.
11. Connect whole blood primed QinFlow Warrior warmer circuit and utilize a pressure infuser.
12. Administer whole blood in 50 mL boluses up to 10 mL/kg. **DO NOT ADMINISTER COLD BLOOD.**
13. The initial infusion rate should be slow to observe for Transfusion Reaction. If no reaction is noted, flow wide open, continually monitoring VS panel for response to therapy or untoward reactions.

Pearls

- Watch for transfusion reaction; if present, stop transfusion, change all lines and utilize normal saline. Bag blood products for return to blood bank, and if necessary, treat with **Allergic Reaction** guidelines.
- Transfusion Reaction is defined as an adverse event experienced by a patient in association with a transfusion that is not explained by the patient's underlying condition.
    - If signs and symptoms of a Transfusion Reaction occur STOP the transfusion immediately. Begin Plasmalyte infusion through new tubing at the desired rate and refer to Allergic Reaction & Anaphylaxis guidelines
    - The blood product unit, filter, tubing and IV solution bag need to be submitted to the clinical department.
- If blood products are readily available, minimize crystalloid fluid administration. If necessary, administer Plasmalyte fluid boluses to maintain *permissive hypotension* prior to blood product availability.
- If giving medications, use the WB site, stop flow, flush with 10cc of NS, give medications, flush with another 10cc of NS, then resume flow. Consider establishing third IV site with fluid or lock for medications
- For additional medication therapies consider the initiation of a second venous site.
- Whole blood may be administered through a patent IO.
- Continue infusions until resuscitation reaches permissive hypotension range (systolic 70 mmHg for uncontrolled hemorrhage; 90 mmHg for controlled). The resuscitation goal is to reach a SBP at or near 100 mm Hg
- Prime IV warmers with 10cc of Plasmalyte or NS prior to starting blood product.
- Do NOT mix medications with Blood Products in the bag
- Do not delay transport to initiate blood products. Initiate enroute if patient is unstable/urgent.
- Notify receiving facility about blood transfusion early.
- Trauma patients receiving blood products should be transported to a Level I or Level II Trauma Center. If this is unavailable, proceed to the next highest level trauma center available.
- Medical patients receiving blood products should be transported to the closest most appropriate facility.

Mandatory Documentation

- Blood Pressure, Pulse, ETCO2, SPO2 and GCS pre and Post Whole Blood Product administration.
- Patient Demographics- Age Sex any comorbidities or other risk factors
- Time of Injury to Time that Whole Blood infusion initiated. (Goal is less than 36 minutes from injury to WB administration)
- Number of units transfused.
- Complete any additional supplemental reports that are required.
- Completion of PCR with Supervisor review prior to call closing.