MTx

Marker Therapeutics

MTx.100 Plasma Adsorption Column
Instructions For Use

For Use With Medical
Plasma Separation Devices

L.039G
December 2023

Contents

Explanation of Symbols in Labeling

	Keep Dry	STERILE	Sterilized By Steam
	Manufacturer Contact Information		Single Use Only
LOT	Lot Number	2°C 50°C	Indicates Temperature Limits for Storage
	See Instructions and Warnings Prior to Use	EC REP	European Authorized Representative Contact Information
	Indicates Expiration Date	CE 0413	CE Mark
	Do Not Use if Package is Damaged	REF	Catalog Number
Rx ONLY	Prescription Only	UDI	Unique Device Identifier

Device Description

The Marker MTx.100 Plasma Adsorption Column ("MTx.100") consists of a sterile, self-contained disposable column. The MTx.100 is intended to assist in blood detoxification. It can be used in instances of drug overdose, hepatic encephalopathy, liver failure, in any condition which results in the release of endotoxin into the bloodstream, and in any condition which generates excess inflammatory response, such as sepsis, septic shock, acute respiratory distress syndrome (ARDS), or systemic inflammatory response syndrome (SIRS).

The MTx.100 operates in conjunction with standard continuous renal replacement therapy (CRRT) devices, plasma apheresis machines, or with any plasma separation device in the hospital. The MTx.100 is integrated into the extracorporeal circuit, downstream of the plasma separation. After priming the MTx.100 and assembling the inlet and outlet lines to the plasma separation extracorporeal circuit, plasma filtration can be run for up to four (4) hours, to be repeated as needed.

In bench testing, the MTx.100 has been shown to remove statistically significant proportions of IL-3, IFN-gamma, IL-10, IL-1B, IL-6, IL-8, MCP-1, TNF-alpha, creatinine, bile acids, and bilirubin when compared to control. The adsorption materials used in the MTx.100 have also been demonstrated to be efficacious in the treatment of drug overdose, including acetaminophen overdose, uremia, barbiturate poisoning, and in the removal of glutethimide.

Treatment duration and indication for exchange of the MTx.100 depend on the clinical course. The maximum treatment time per single MTx.100 is four (4) hours.

The instructions herein must be carefully and fully observed to ensure the safe and effective use of the MTx.100. All related personnel must be completely familiar with these instructions before using the MTx.100.

The MTx.100 must never be used for any purpose other than the indication described in these instructions. Marker Americas LP and Marker Therapeutics AG will bear no responsibility whatsoever in relation to its use for any other purpose.

Indications & Contraindications

Indications

The Marker MTx.100 Plasma Adsorption Column is intended for adjunct use in any condition that requires a reduction of inflammatory cytokines or metabolic waste products and in the treatment of drug overdose and poisonings.

The MTx.100 Plasma Adsorption Column filters plasma. It works with standard hospital equipment and blood lines and can be used when acute hemodialysis, apheresis, or therapeutic plasma exchange (TPE) is prescribed by a physician.

Contraindications

The MTx.100 Plasma Adsorption Column should not be used on patients <18 years of age.

The MTx.100 Plasma Adsorption Column should not be used in women who are pregnant or breastfeeding.

The MTx.100 Plasma Adsorption Column should not be used on patients for whom treatment with an anticoagulant is inappropriate or are at increased risk for bleeding.

The MTx.100 Plasma Adsorption Column should not be used on patients with a known hypercoagulable condition manifesting in history of highly suspected deep venous thrombosis or pulmonary embolism.

L.039G
December 2023

Warnings

The MTx.100 Plasma Adsorption Column is for use with plasma only and not for use with whole blood.

Do not treat patients who are actively bleeding. If a patient begins bleeding during a treatment, discontinue treatment.

Due to the possibility of coagulation factor adsorption in the MTx.100 Plasma Adsorption Column, the use of this product in the treatment of patients who have a bleeding tendency must be approved by the responsible physician.

Carefully read these Instructions for Use before performing treatment with the MTx.100 Plasma Adsorption Column. Also consult and understand the plasma separation device Instructions for Use.

The MTx.100 Plasma Adsorption Column is for single use only. DO NOT REUSE due to risk of infection or contamination.

Use proper aseptic technique during assembly and use to avoid contamination.

The MTx.100 Plasma Adsorption Column must be fully primed before use by the procedure described in this manual.

The MTx.100 Plasma Adsorption Column must be used only in accordance with the directions of a responsible physician who is familiar with the condition of the patient.

During plasma adsorption, continuously monitor patient's condition and any possible reactions to the plasma adsorption process by observing physiologic parameters including body temperature, heart rate, respiratory rate, blood pressure, and coagulation time. In the event of any abnormality, suspend treatment in accordance with the directions of the responsible physician. Blood, plasma and anticoagulant flow rates must also be frequently monitored.

If any problem occurs during treatment with the MTx.100 Plasma Adsorption Column, immediately ensure the safety of the patient and take appropriate measures, such as discontinuation of the treatment, replacement of the MTx.100, or adjustments to vascular access, in accordance with the directions of the responsible physician.

Because of the possibility that some types of medication may be removed by adsorption during treatment, all medications must be administered only in accordance with the directions of the responsible physician and the precautions and instructions relevant to the medication.

Precautions

System Precautions: Before Use

The MTx.100 Plasma Adsorption Column is not to be used after the expiration date has passed.

The MTx.100 Plasma Adsorption Column must be stored in a clean, dry area, at 2-50C (36-122F).

The MTx.100 Plasma Adsorption Column is comprised of plastic products and must not be exposed to excessive vibration or shock.

The MTx.100 Plasma Adsorption Column is provided sterile and non-pyrogenic if its sterile barrier package and seal are intact.

Do not re-sterilize.

Examine each MTx.100 Plasma Adsorption Column tray prior to use. Do not use a MTx.100 that appears to have been damaged or whose sterile barrier seal has been broken.

To avoid contamination, do not remove the MTx.100 Plasma Adsorption Column from the sealed tray until just before priming and assembly. Prime, assemble, and operate MTx.100 using aseptic technique.

Any MTx.100 Plasma Adsorption Column showing signs of leakage or other abnormality during priming must be replaced, and the priming procedure restarted on the new MTx.100.

The dosage of anticoagulant varies depending upon individual patients and should be determined by physician's instruction.

The MTx.100 Plasma Adsorption Column may reduce antibiotic levels during treatment. Physicians should consider dosing antibiotics immediately after MTx.100 treatment and monitor antibiotic dosage in a similar manner for patients on a course of multiple MTx.100 treatments.

L.039G
December 2023

System Precautions: During Use

Before and during treatment with the MTx.100 Plasma Adsorption Column, ensure there is no leakage in any extracorporeal circuit connection or component.

The tolerance pressure of the MTx.100 Plasma Adsorption Column is 300 mmHg; however, inlet pressure must be maintained below 200 mmHg in order to prevent clogging and other abnormalities during operation. If pressure exceeds 200 mmHg at any time during operation, treatment is to be suspended and the cause of the high pressure is to be resolved before continuing treatment. Alternatively, the plasma flow rate may be reduced to alleviate the pressure buildup. In the event that a cause cannot be resolved, the MTx.100 can be replaced with a new primed column or the treatment can be discontinued at the order of the treating physician.

After treatment with the MTx.100 Plasma Adsorption Column has begun, clotting in the MTx.100 may occur if the procedure is halted. Upon restarting treatment, monitor the pressure closely for potential occlusion related to over-pressure.

Ensure that no air enters the patient's blood vessels during the procedure or during rinse-back.

The MTx.100 Plasma Adsorption Column may adsorb blood glucose. During and after treatment, closely monitor patient's blood glucose levels and adjust per hospital protocol.

System Precautions: Following Use

Dispose of the used MTx.100 Plasma Adsorption Column in accordance with institutional standards for biohazardous medical waste disposal.

After treatment, monitor and adjust patient's blood anticoagulation levels per hospital protocol.

Notes Before Use

The WARNINGS and PRECAUTIONS sections must be fully and carefully read and understood before using the MTx.100 Plasma Adsorption Column.

Note: The MTx.100 Plasma Adsorption Column is designed for use with hospital plasma separation devices. Please refer to the Operator Manual for the plasma separation device for the proper use of that device.

Note: Perform all assembly and preparation procedures with aseptic technique.

Note: When indicated or ordered by the physician in charge, treatments may be interrupted or stopped.

Frequently Asked Questions

What types of plasma separation devices are compatible with the MTx.100 Plasma Adsorption Column?
CRRT and apheresis machines with plasma separation capabilities are compatible.

What is a complete list of materials that I need to operate the MTx.100 Plasma Adsorption Column?
- Plasma separation device (e.g., a CRRT system with plasma adsorption function/capability or an apheresis machine with continuous plasma separation function)
- Tubing set that will accommodate the MTx.100 without any cutting, splicing, or bonded connections
- IV bag filled with appropriate priming solution
- Pressure cuff for the IV bag
- Blood line tubing set
- > 1.5 L waste bag
- Two hemostats

Should I run the CRRT or apheresis machine (herein "plasma separation device") self-checks and priming sequences?
You should follow the plasma separation device manufacturer's Instructions for Use, including self-checks and priming sequences that are described.

What plasma flow rates are allowable for the MTx.100 Plasma Adsorption Column?
The MTx.100 is capable of operating at a plasma flow rate between 15 – 50 mL/minute.

How long should the patient cycle on the MTx.100 Plasma Adsorption Column?
A patient can cycle on one MTx.100 for up to four hours, at the discretion of the responsible physician.

What type of IV saline should I use?
IV saline should be determined by the responsible physician.

What can the MTx.100 Plasma Adsorption Column filter from the patient's plasma?
In bench studies, the MTx.100 has been shown to remove statistically significant proportions of the cytokines IL-3, IFN-gamma, IL-10, IL-1B, IL-6, IL-8 and MCP-1 in addition to TNF-alpha, creatinine, bile acids, and bilirubin when compared to control. This type of technology can also be used to treat drug overdose, such as acetaminophen overdose.

MTx.100 Plasma Adsorption Column Packaging

Within the MTx.100 carton are up to three MTx.100s, contained within individually sealed trays.

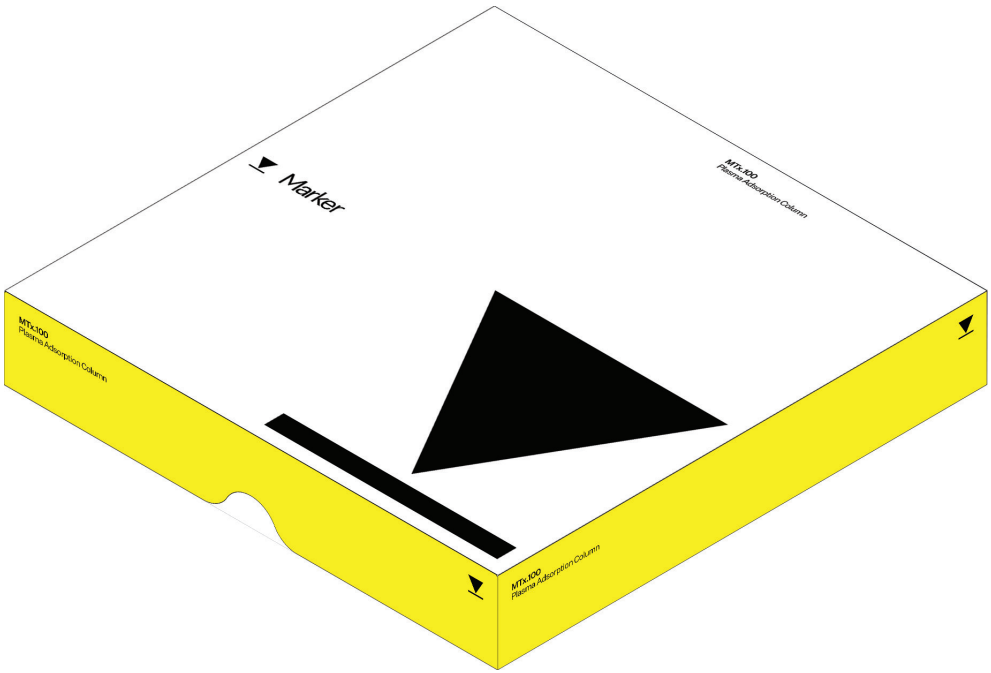

Figure 1.
Carton Containing MTx.100(s)

Remove tray from the carton. Peel the lid to access the MTx.100.

Note: Column sterile barrier should be maintained until just before priming is initiated in order to avoid contamination.

The sterile MTx.100 is within the tray.

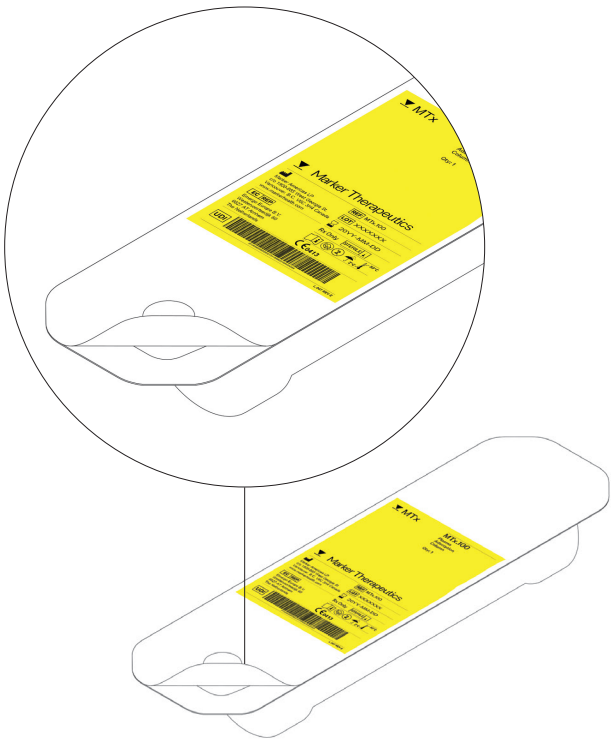

Figure 2.
Lid Being Peeled Off Tray

Figure 3.
MTx.100 Plasma Adsorption Column

Prime the MTx.100 Plasma Adsorption Column

Materials required:
- 1 L bag of saline solution
- Pressure cuff
- Two blood line tubing sets, **(A)** and **(B)**
- Two clamps/hemostats
- Waste bag

1. Mount the MTx.100 vertically with the blue outlet port facing up.

Note: Saline solution should flow in direction of arrow during priming.

2. Place the 1 L bag of saline solution into a pressure cuff. Spike saline bag with **(A)**, deaerate, and prime the line. Close the clamp of **(A)** at the location indicated by the || symbol and hang the bag.

3. Connect **(A)** to the red inlet port of the MTx.100. Connect **(B)** to the blue outlet port of the MTx.100 and to the waste bag.

4. Pressurize the saline bag cuff to ~300 mmHg. Open clamps of **(A)** and **(B)** to begin priming the MTx.100.

5. When the MTx.100 is full of fluid, close clamps of **(A)** and **(B)** and remove the MTx.100 from holder. Hold the MTx.100 and gently rock it up and down to distribute adsorbents evenly.

6. Reinsert MTx.100 into holder (blue outlet port facing up), open clamps of **(A)** and **(B)** and complete the rinse with the remaining saline solution.

7. When the MTx.100 has finished priming, close clamps of **(A)** and **(B)**. Remove the saline bag and waste bag from **(A)** and **(B)**. Discard the saline bag and waste bag.

8. Prime the plasma separation device per manufacturer's instructions.

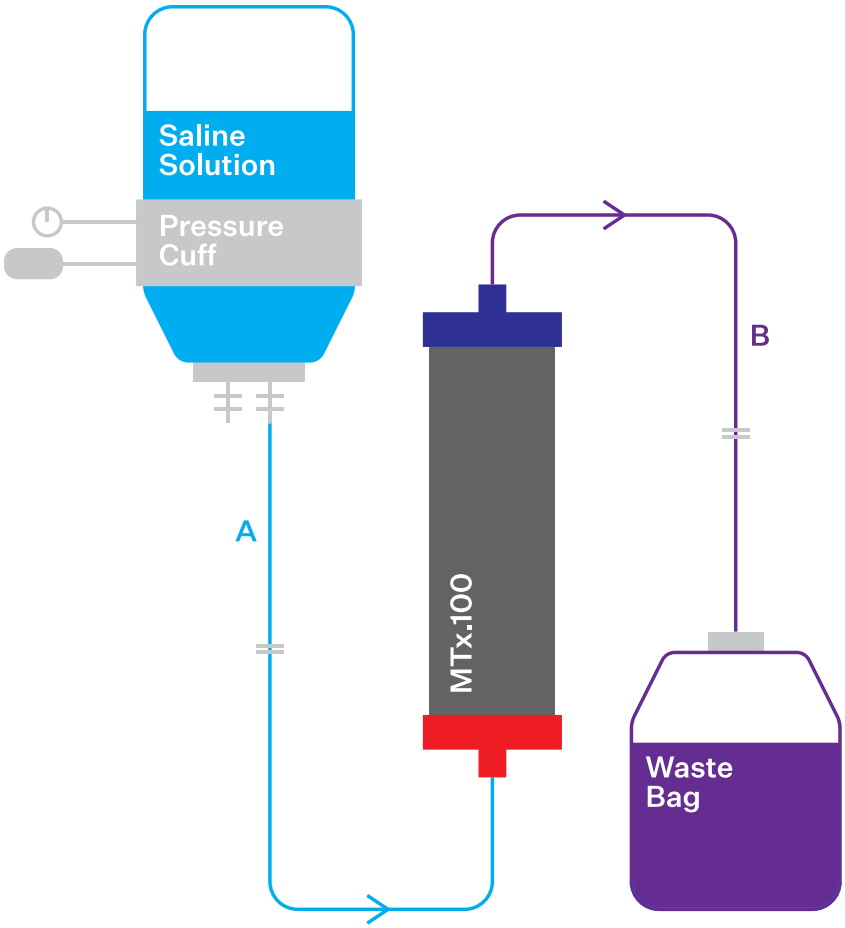

Figure 4.
MTx.100 Priming Circuit

Connect MTx.100 Plasma Adsorption Column to the Plasma Separation Device

Materials required:
- Two plasma lines, (C) and (D)
- Three clamps/hemostats

1. After priming, stop the plasma separation device.

2. Using hemostats, clamp all tubes at the locations indicated by the || symbol.

Note: Never remove (A) and (B) at once from the MTx.100.

3. Flip the MTx.100 180° so that the red inlet port is facing up. Remove (A) from the red inlet port, being careful to avoid draining the priming solution. Connect (C) to the red inlet port.

4. Flip the MTx.100 180° so that the blue outlet port is facing up. Remove (B) from the blue outlet port. Connect the (D) to the blue outlet port.

5. Insert the MTx.100 into the holder with the blue outlet port facing up.

Note: Plasma should flow in direction of arrow during treatment.

6. Remove the hemostats from (C) and (D).

Caution! Anticoagulation must be effective at the beginning of the treatment. Anticoagulation regimen should be chosen at the discretion of the responsible physician.

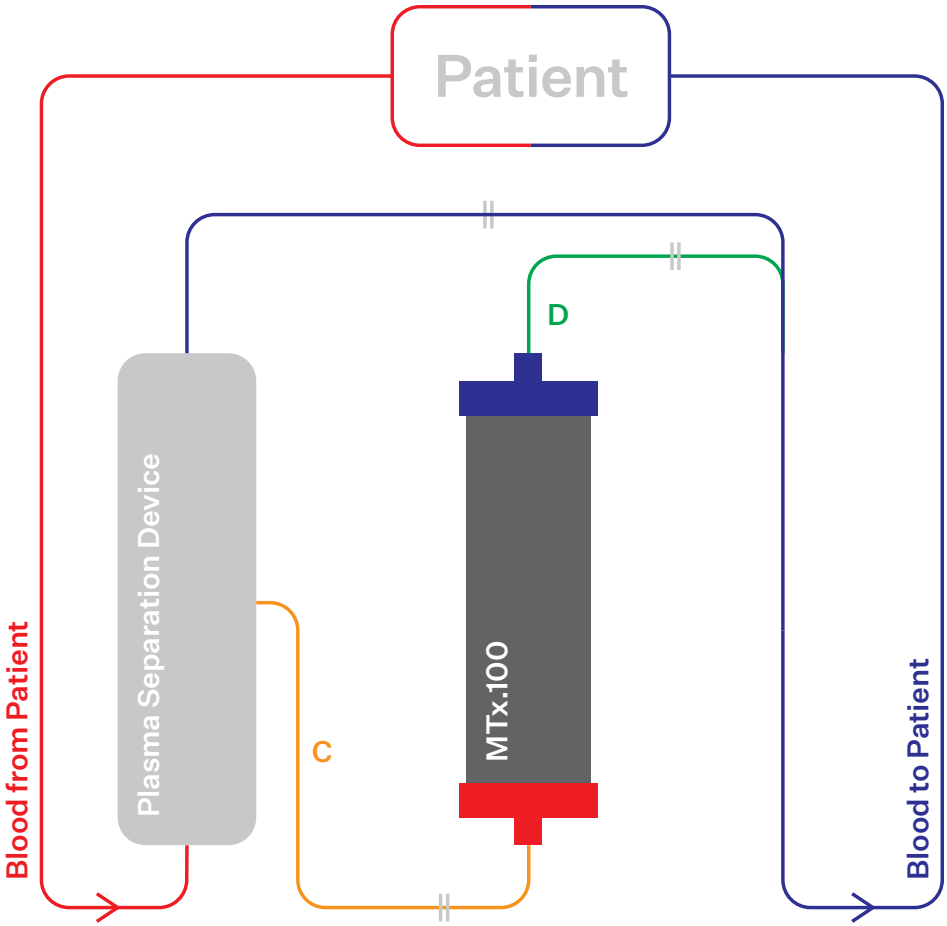

Figure 5.
Fluid Schematic for Treatment with the MTx.100

Operation of the Plasma Separation Device

Refer to the plasma separation device manufacturer's instructions for use for operation of the plasma separation device (e.g., CRRT system in plasma separation mode or Apheresis system with continuous plasma separation capabilities).

Initiate Treatment

1. Adjust the flow rate of plasma between 15 and 50 mL/minute.

2. Start patient treatment according to plasma separation device manufacturer's instructions.

3. Patient can cycle on one MTx.100 for up to four (4) hours.

Warning! Monitor and adjust blood anticoagulation levels per hospital protocol.

Caution! The aPTT and ACT should be checked at regular intervals and closely monitored during the course of treatment to inform adequate anticoagulation.

Note: Check the circuit regularly to confirm there are no signs of blood clots, no air in the circuit, and the tubing lines are secure.

Note: If pressure exceeds 300 mmHg at any time during operation, treatment is to be suspended and the cause of the high pressure is to be resolved before continuing treatment. Alternatively, the plasma flow rate may be reduced to alleviate the pressure build up. In the event that a cause cannot be resolved, the MTx.100 can be replaced with a new primed column or the treatment can be discontinued at the order of the treating physician.

Conclusion of Treatment

Materials required:
- 1 L bag of saline solution
- Blood line tubing set **(E)**
- Two clamps/hemostats

1. Initiate plasma separation device chase-back sequence 10 minutes prior to conclusion of procedure.
2. Spike a 1 L bag of saline solution with **(E)**. Prime the drip chamber and **(E)** then clamp **(E)** and **(F)** at the locations indicated by the || symbol. (Note that **(F)** is the existing blood line coming from the patient.)
3. Aseptically connect the other end of **(E)** to the blood line sample port of **(F)** located between the patient and the plasma separation device.
4. Reduce the blood flow rate to approximately 60 ml/min or as otherwise ordered by the responsible physician. Open the clamps to **(E)** and **(F)**.
5. Under the direction or orders of the responsible physician, clamp **(F)** at || and flush **(F)**.
6. Allow the plasma separator to draw solution from the IV bag and "chase" autologous blood and plasma back to the patient.
7. Under the supervision of the physician, stop the "chase" before the 1 L IV bag is empty. If chase-back procedure terminates prior to the re-transfusion of all autologous blood products, aseptically drain remaining autologous blood products into a suitable transfer (transfusion) bag for later administration.
8. After chase-back is complete, clamp **(G)** at ||.
9. Using aseptic techniques, separate **(F)** and **(G)** from the patient catheter.
10. Treat and secure the catheter ports per the manufacturer's instructions and/or hospital standard operating procedure.
11. Dispose of used MTx.100 according to institutional procedure for biohazardous waste disposal.

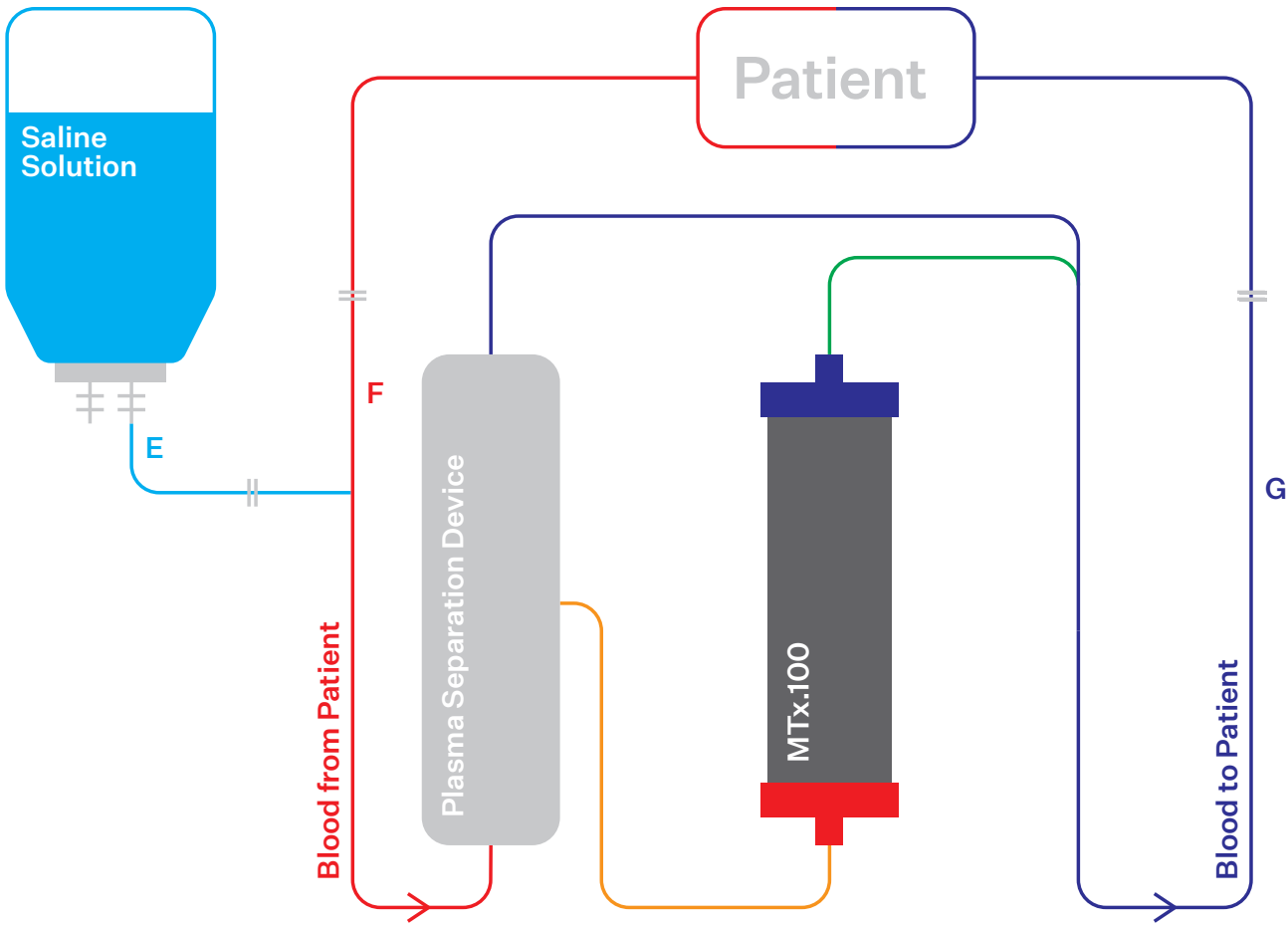

Figure 6.
Schematic for Chase-Back Procedure

Marker Americas LP
c/o 1900 – 885 West Georgia Street
Vancouver, B.C. V6C 3H4
Canada
www.markerhealth.com

EC REP Emergo Europe B.V.
Westervoortsedijk 60
6827 AT Arnhem
The Netherlands

CE 0413

Marker Therapeutics AG warrants that reasonable care has been used in the manufacture of this device. This warranty is exclusive and in lieu of all other warranties whether expressed, implied, written or oral, including, but not limited to, any implied warranties of merchantability or fitness. As a result of biological differences in individuals, no product is 100% effective under all circumstances. Because of this fact and since Marker Therapeutics AG has no control over the conditions under which the device is used, diagnosis of the patient, methods of administration or its handling after it leaves its possession, Marker Therapeutics AG does not warrant either a good effect or against an ill effect following its use. The manufacturer shall not be liable for any incidental or consequential loss, damage or expense arising directly or indirectly from the use of this device. Marker Therapeutics AG will replace any device which is defective at the time of shipment. No representative of Marker Therapeutics AG may change any of the foregoing or assume any additional liability or responsibility in connection with this device.

L.039G
December 2023