University Health™	Policy #: Rad Proc 14. 12
Operating Guidelines for the Medrad Spectris MR Injector	**Effective: 10/1/2013** **Revised: 2/2015: 2/2017**
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Purpose: In order to minimize extravasations and maintain imaging quality the following guidelines and instructions shall be used.

Guidelines:

1. Use a 20 gauge or larger IV catheter over needle (a 22 gauge may be used with slower flow rates).
2. The preferred location for venipuncture is the medially located
3. Antecubital vein.
4. Have at least ½ inch of the catheter positioned in a good vein with rapid backflow.
5. Tape the catheter securely to avoid catheter movement.
6. A winged catheter-over-needle allows easy insertion into the vein and secure taping.
7. Use a 60 – 96 inch coiled low pressure tube securely attached to catheter. The coiled tubing reduces motion effect during table incrementation.
8. Instruct the patient to communicate immediately any pain or change in feeling during the injection.
9. If possible, instruct the patient to put his or her arm vertically above the shoulder with the palm of the hand on the face of the gantry during injection. This allows for uninterrupted passage of injected contrast through the axillary and subclavian veins at the thoracic outlet.
10. A small volume test injection of contrast or saline may be utilized to confirm venous access. A trained professional must remain by patient during the initial stages of the injection palpating the venous access site to ensure proper placement of the I.V. catheter. If local pain, swelling or signs of extravasation are noted, the injection should be stopped immediately.
11. Central lines and hep-locks should only be used in accordance with hospital policy guidelines.
12. Adhere to all instructions, warnings, and cautions listed for the specific products being used.

Syringe Installation

1. Place the Injector Head in an upright position with both pistons fully retracted.
2. Inspect syringe packaging for date expiration and package integrity.
3. Syringes are sterile and for Single-Use-Only.
4. Ensure proper engagement of the syringe. Improperly engaged syringes may leak or be damaged.
5. Align the flanges on the syringe, insert, and rotate it clockwise ¼ turn until the syringe locks into place.
6. Syringes are correctly mounted when the alignment marks on the syringe and injector head line-up with the piston and plunger interlocked.
7. If a syringe is removed from the injector and re-installed, ensure the alignment marks on the syringe and injector head line-up with the piston and plunger interlocked.
8. Expel all air from the syringes – fully advance both pistons using the Enable key – Forward Load button.
9. Using sterile technique, attach loading devices and load contrast and/or saline into the syringes. Syringe A – contrast Syringe B – saline
10. Expel all air from the syringes using the manual knobs or Forward Load button
11. Attach the end of connector tubing with back check valve to Syringe A and the other side to Syringe B.
12. Prime Syringe A to the mid area of the T-connection and Syringe B to the end of the connector tubing.
13. FluiDots – View in an appropriately illuminated area with the light source behind the operator. Viewed through an empty syringe, dots appear as narrow ellipses. Viewed through a full syringe, dots are larger and almost round
14. Carefully inspect the syringe, connector tubing, and FluiDots to confirm that all air has been expelled. Turn the injector head down and connect the Low Pressure Connector Tubing to the patient.
15. Armed Indicator Lights will light continuously for the injecting syringe and flash for the armed syringe. Syringe A-White Syringe B- Blue

Program Display Control Panel

1. Four phases are available for programming – 2 contrast, 2 saline. Syringe A can be used alone Syringe B can only be used in conjunction with Syringe A.
2. Flow Rate – 0.1 to 10 ml/sec
3. Volume -1 to 63 ml
4. Delay – Scan, Inject or No Delay. When Delay reaches zero, five beeps are emitted.
5. Volume Remaining, Total Volume, and duration are displayed.
6. Battery Status – Store batteries in a fully charged condition. Charge and Injection battery should be monitored daily. Pull Injection battery out one inch when not in use.
7. KVO- 0.25 ml delivered every 30 seconds. Activated when Start switch is pressed. Active during delays, before and after an injection, and between multiple injections.

Injection Procedures

1. ARM – Touch Arm key. Select Single or Multi arm.
2. Insufficient volume – occurs when there is not contrast/saline to complete the protocol. INSUF appears above the Volume Remaining window.
3. AIR IN FLUID PATH – Verify, "is all air expelled from the syringe and fluid path and are all injection parameters correct?" Air embolism can cause death or serious injury to the patient. Patient injury could result from high flow-rate venous injections.
4. Select Yes/Arm key to proceed or No/cancel to abort.
5. START – initiate injection.
6. If KVO is selected, KVO running is displayed. If KVO is selected and running, press start to initiate injection.
7. Injected Volume, Duration Increment, and Volume Remaining count down. Each phase is highlighted when active.
8. ABORT the injection, press: Disarm or Display Screen or Any button on Head
9. Place the injection on hold for up to 10 minutes by pressing the Start/Hold switch.
10. INJECTION COMPLETE – displayed at the end of the injection.
11. STATUS – view actual injection parameters.
12. Remove the syringe with attached low pressure connector tubing and dispose.

Store/Recall Program

1. STORE – stores 20 protocols in memory.
2. Select Title Block beside Protocol and enter protocol name. Press Store, select location, press Store.

3. Protocols cannot be deleted. Write-over old/unused protocols.
4. RECALL - Press Recall, highlight protocol, press Recall.

Control Panel Keys

1. HELP key provides information on system operation and service.
2. INVERSE key displays the screen white on black or black on white.
3. DISPLAY CONTRAST keys adjust screen contrast.

System Malfunctions

1. Patient injury may result from a system malfunction. If a system malfunction occurs, immediately remove power from the Scan Room Unit by pulling the battery from the Head Control Unit, and disconnect the system from the patient.
2. Do not reconnect the patient until the system has been powered-up, armed, and a test injection has been performed to verify that the system malfunction has been resolved. If a fault message is displayed that cannot be corrected and/or the system is not operating correctly. Do Not Use the injection system. Call MEDRAD for assistance.
3. Routine inspections and maintenance will ensure continued performance and reduce equipment malfunction MEDRAD recommends complete calibration and a performance check annually.

Clean-Up

1. SHOCK HAZARD – To avoid shock and prevent damage to the injector, always disconnect the Main Control Unit from line power, and remove the battery from the Head Control Unit before cleaning.
2. Wipe components with a soft cloth or paper towel dampened with cleaning solution. Do not use strong industrial cleaning solvents.
3. Do not allow water or cleaning solutions inside the injector head or into areas where the battery pack is inserted.
4. For all body fluid spills, follow the institutional decontamination procedures.