



MEDRAD® Stellant FLEX CT Injection System Advances: Visual Air Identification and Injector Face Cleaning

Deliver quality patient care with MEDRAD® Stellant FLEX CT Injection System



Importance of Air Identification

Accidental air administration into a patient's vein can occur during contrast media injection.¹⁻³ In CT, venous air embolism can be identified as air bubbles or air-fluid levels in the intrathoracic veins, main pulmonary artery, or right ventricle.⁴ Small amounts of air bubbles are generally absorbed and do not harm.^{5,6} Case reports suggest that 100 - 300 mL of air injected into the venous system of adults can be fatal¹⁰. It is becoming more common that air bubbles may travel through a patent

foramen ovale into the arterial systemic circulation causing stroke or myocardial infarction even at lower injected volumes.^{1,7,8}

MEDRAD® FluiDots Indicators and Beacon Technology are Unique and Can Aid in the Visual Detection of Air in the Syringes

The MEDRAD® Stellant CT Injection System features clear syringes with MEDRAD® FluiDots as an air identification technology which assists the user in distinguishing empty from filled syringes. FluiDots are small regions embedded in the transparent syringe material that appear as narrow ellipsoids when the syringe contains air and almost round when the syringe contains fluid. The MEDRAD® Stellant FLEX CT Injection System incorporates an added feature - Beacon Technology, which indicates the presence of fluid in an upright syringe by reflecting the plunger colour at the syringe tip, when there is >5ml of air in the syringe the Beacon will not appear. While most CT injectors provide effective features and instructions to support radiographers in avoiding air injections, Beacon Technology that's featured only in the MEDRAD® Stellant FLEX Injector enables identification of air in the fluid path right before the injection.

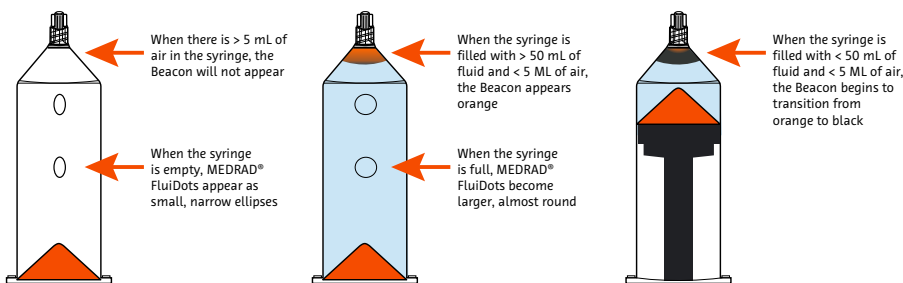


Figure 1. Visual air detection technologies. MEDRAD® FluiDots change from ellipses in an empty syringe to round dots in a filled syringe. Beacon technology indicates the presence of fluid in an upright syringe by reflecting the plunger colour at the tip of the syringe. Beacon colour will darken as the fluid volume in the syringe decreases.

In a recent study, Beacon technology was shown to be a valuable new method of air identification in addition to transparent syringes with MEDRAD® FluiDots when assessed from various distances and under different lighting conditions. The new air indicators in the MEDRAD® Stellant FLEX injector provided better air detection at longer distances and all lighting conditions.⁹



Figure 2: Experimental setup for air detection per participant.

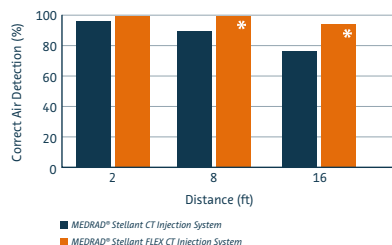


Figure 3. MEDRAD® Stellant FLEX CT Injection System provided better air detection at longer distances of 8 and 16ft.

Data is derived from animal studies

Improved MEDRAD® Stellant FLEX CT Injection System Design Facilitates Efficient and Complete Cleaning

Efficient and quick cleaning of the injector from contrast media spills is imperative. Spilled contrast media can lead to a sticky hardened surface that can potentially damage the injector.

The MEDRAD® Stellant CT Injection System face has raised buttons which have crevices, while the MEDRAD® Stellant FLEX Injector has buttons on a flush surface. In the same study a homogenous mixture of 370 concentration contrast media and invisible ink was applied to cover the injector face. Participants performed a quick clean for 5 seconds followed by a full clean, which lasted up to 1 minute until study participant was satisfied that all contrast was cleaned. After the 5 second quick clean, the MEDRAD® Stellant FLEX Injector face had less contrast mixture remaining than did the MEDRAD® Stellant Injector face. The MEDRAD® Stellant FLEX Injector required less time to reach a greater level of cleanliness and showed less contrast mixture residue.⁹

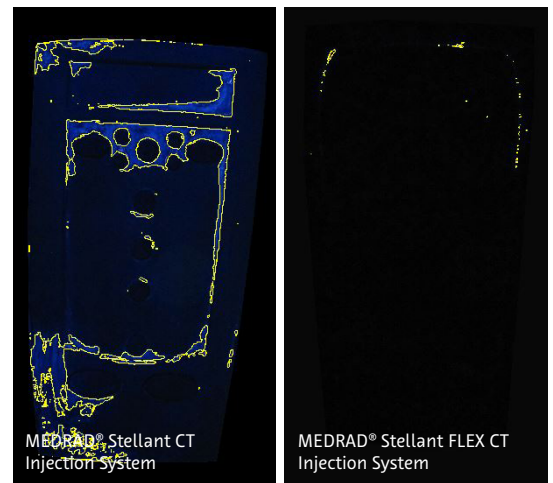


Figure 4. Residual contrast shown in black light after full clean

References:

1. Judge C, Mello S, Bradley D, Harbison J. A systematic review of the causes and management of ischaemic stroke caused by nontissue emboli. *Stroke Res Treat.* 2017;2017:7565702. doi:10.1155/2017/7565702
2. Orebaugh SL. Venous air embolism: clinical and experimental considerations. *Crit Care Med.* 1992;20(8):1169-1177. doi:10.1097/00003246-199208000-00017
3. Sodhi KS, Saxena AK, Chandrashekar G, et al. Vascular air embolism after contrast administration on 64 row multiple detector computed tomography: a prospective analysis. *Lung India.* 2015;32(3):216-219. doi:10.4103/0970-2113.156216
4. Price DB, Nardi P, Teitcher J. Venous air embolisation as a complication of pressure injection of contrast media: CT findings. *J Comput Assist Tomogr* 1987; 11:294-295.
5. Emby DJ, Ho K. Air embolus revisited—a diagnostic and interventional radiological perspective (bubble trouble and the dynamic Mercedes Benz sign). *Afr J Online.* 2006;10(1):3-7. doi:10.4102/sajr.v10i1.186
6. van Hulst RA, Klein J, Lachmann B. Gas embolism: pathophysiology and treatment. *Clin Physiol Funct Imaging.* Sep 2003;23(5):237-246.
7. Wilkins RG, Unverdorben M. Accidental intravenous infusion of air: a concise review. *J Infus Nurs.* Nov-Dec 2012;35(6):404-408.
8. Yeddula K, Ahmad I, Mohammed SH, et al. Paradoxical air embolism following contrast material injection through power injectors in patients with a patent foramen ovale. *Int J Cardiovasc Imaging.* Dec 2012;28(8):2085-2090.
9. Czubor, Adam, et al. "Comparison of 2 CT Contrast Media Injection Systems: Visual Air Identification and Injector Face Cleaning." *Radiologic Technology* 91.3 (2020): 214-222.
10. A. Brodbeck et al. Venous air embolism: ultrasonographic diagnosis and treatment with hyperbaric oxygen therapy *BJA*;121 (6) 1215-1217 (2018)

Bayer reserves the right to modify the specifications and features described herein or to discontinue any product or service identified in this publication at any time without prior notice or obligation. Please contact your authorised Bayer representative for the most current information.

Bayer, the Bayer Cross, MEDRAD, MEDRAD Stellant, MEDRAD Stellant FLEX, MEDRAD FluiDots, Stellant, Stellant FLEX and FluiDots are trademarks owned by and/or registered to Bayer in the U.S. and/or other countries. Other trademarks and company names mentioned herein are properties of their respective owners and are used herein solely for informational purposes. No relationship or endorsement should be inferred or implied.

© 2022 Bayer. This material may not be reproduced, displayed, modified or distributed without the express prior written consent of Bayer.



Manufacturer
Bayer Medical Care Inc.
1 Bayer Drive
Indianola, PA 15051-0780
U.S.A.
Phone: +1-412-767-2400
+1-800-633-7231
Fax: +1-412-676-4120

Australian Sponsor
Imaxeon Pty Ltd
Unit 1, 38 – 46 South Street
Rydalmere, NSW 2116
Australia
Phone: 02 8845 4999
Fax: 02 8845 4936
Customer Service: 1800 633 723