

# The EggNest: A Simple, Table-Integrated Platform to Reduce Scatter Radiation by >90%

CLD talks with: *Jebadiah Bera, RN, MSN, Director, Cath Lab and Diagnostic Cardiology, Ascension Seton Hays Medical Center, Kyle, Texas; and Vamsi Krishna, MD, FACC, FSCAI, Director Cardiac Cath Lab, Ascension Seton Hays Medical Center; Director, Cardiac Rehab; Assistant Professor, UT Dell Medical School, Seton Heart Institute, Austin, Texas.*

**I. Jebadiah Bera, RN, MSN, Director, Cath Lab and Diagnostic Cardiology, Ascension Seton Hays Medical Center, Kyle, Texas**

**Can you tell us about your cath lab?**

**Jebadiah:** We have three active cath labs, and perform a broad spectrum of cardiac cath, peripheral, and interventional radiology cases. We are doing a lot of cases with longer time frames. Our lab is probably the busiest peripheral lab in the central region for our hospitals and we are also the hub for a wide rural area.

**How concerned are you and your team about scatter radiation?**

**Jebadiah:** We are very concerned about scatter radiation. Research is continuing to show how it affects those that are performing procedures, who are physically closest to the patient, and also how physicians are coming back with issues and possible cancer. We are always very cautious. We stay away

from the source of radiation as much as we can and properly wear lead. We have a strong team with a mix of 15- to 20-year veterans in the lab and people with 1 or 2 years of experience. It is a wide range, but for almost everyone on our team, this is their profession. This is where they want to be for a long time. Dr. Krishna and our other physicians have done a great job of bringing even greater awareness to radiation safety. They have been strong champions for us to care for ourselves and to do what is right. We continue to look at the next and new thing to find the best way to keep ourselves safe while caring for patients.

**How long have you had the EggNest?**

**Jebadiah:** It has been in two of our labs for about a year. Our third lab was just built and we are working on getting the EggNest (Egg Medical) into that lab as well. A few years ago, Dr. Krishna came to me after learning about the EggNest and we started looking into it. We had already been focusing on radiation

protection in our discussions and saw it as the next step to help prevent any future issues. The EggNest protects the team and the provider. It has shielding all around it and the table itself has shielding. The way the EggNest been engineered and developed, it deflects the scatter. As the beam hits the patient and then scatters out, the EggNest deflects that radiation from the staff and the physician.

**What was your goal for the team in regards to reducing scatter radiation?**

**Jebadiah:** Part of the installation involved getting a real-time dosimeter in the lab. The claim was that the EggNest could produce between 85 to 95% of the scatter. Our goal was to get at least 75 to 90% scatter reduction. After seeing the real time dosimeter, there was good data showing an 85 to 95% reduction.

**How does the EggNest fit into your team’s overall workflow?**

**Jebadiah:** The EggNest has built-in arm boards and shielding that folds down and captures the scatter. It is bulkier, so that when you pull the bed up to the table to have the patient transfer over, you have to be able to adapt that process. The patient is still accessible and the procedure is the same; the case itself and then the practice of caring for the patient itself does not change. Cleaning is the same as for the normal table. You wipe it down with the appropriate cleaning material and it air-dries after the time allotted. Every piece on the EggNest is modular. If you happen to get something within a crevice, for example, you can take it apart to clean it and put it back together.

**Before the EggNest, are there other things that your lab attempted to help reduce radiation exposure for the team?**

**Jebadiah:** We tried multiple things, including a rolling shield for the team up by the head of the bed and lead caps; they didn’t do well. The doctor uses a Zero-Gravity system (Biotronik). We do use Radpads (Worldwide Innovations & Technologies) as well, which help. Radpads are small pads that lay on top of the patient. We have doubled up on those in combination with the EggNest to prevent radiation scatter.

**How has the team performed their roles with the EggNest in place?**

**Jebadiah:** The EggNest wasn’t a big change in their workflow. When we first got it, our team shared some minor issues and the company has fixed them in its current 2.0 version, which we now have. The response to the changes by our team is that the EggNest is now significantly improved.

**Do team members wear radiation badges that are regularly reviewed?**

**Jebadiah:** Yes. We have seen a reduction in our radiation, but it is hard to quantify now with COVID



and case fluctuations, which also affect how much radiation is utilized. Early on, before the pandemic hit, we tracked our radiation exposure and saw a large reduction in radiation. Once things start to normalize, we plan to start tracking again to provide further validation.

**How has COVID affected your lab?**

**Jebadiah:** We have seen it affect our volume, case preparation, and anxiety levels. Without a lot of certainty around COVID, most facilities have asked the same questions: “How do I care for these patients? What’s the best way to do it?” Ever since the beginning of the pandemic, we’ve had strong backing from our leadership and our physicians about having proper personal protective equipment and going into every case fully prepared, so the team doesn’t feel nervous. Now it is second nature. We have seen so many COVID-positive patients. We are able to get a rapid test on emergent cases so that we know shortly after we start whether the patient is positive, but we still treat it as if every patient is positive. Even if someone is asymptomatic, the team is still going to be fully protected. The anxiety is the part that we’ve had to learn to live with and modify our practice from there.

**Any final thoughts?**

**Jebadiah:** The ability to plug and play — to put the EggNest right on top of the table and have that much safety and radiation reduction right away, without a big interruption to the lab, has been huge. The EggNest, in conjunction with other radiation devices, like the RadPad and the Zero-Gravity system, and even labs that have radiation reduction software built into their equipment, still brings an enormous reduction in scatter radiation. It is like night and day. The EggNest brings peace of mind to the entire team when they fully understand how much safer it is.

**II. Vamsi Krishna, MD, FACC, FSCAI, Director Cardiac Cath Lab, Ascension Seton Hays Medical Center; Director, Cardiac Rehab; Assistant Professor, UT Dell Medical School, Seton Heart Institute, Austin, Texas**

**Can you tell us about your work and why you are a radiation safety champion?**

**Dr. Krishna:** I am an interventional cardiologist specializing in complex cases in both the coronary and peripheral vasculature, and have been in practice for over six years. One of the key problems in dealing with peripheral vascular disease is that the interventions take longer and you are exposed to higher amounts of radiation. If you are doing several procedures a day, this cumulative additional radiation will lead to unfortunate complications later in life. I believe that reducing radiation exposure is a number-one goal for operators. When I came to Ascension Seton Hays Medical Center 6 years ago, we immediately incorporated numerous different techniques. We purchased a Zero-Gravity hanging lead system to reduce radiation to the operator and allow them to avoid taking on the weight of the lead. Second, we use RadShields and Radpads to reduce scatter radiation by around 75%. Third, we use Rad Boards (Merit Medical) for radial procedures to reduce radiation scatter underneath the table. We also practice grid technique, using oblique angles and keeping patients positioned to receive the least radiation during their procedure. Finally, we were one of the first sites in the United States to use the EggNest. With the EggNest, the patient is literally in a kind of cradle that allows protection for not only the patient and the physician, but also the staff. The EggNest blocks the radiation from hitting the nurse at the head of the table, or the technologist at the end of the table. We have tested the EggNest with radiation detectors, and measure almost zero radiation by using the system; radiation with the EggNest in place is less than 10% as compared to without the EggNest. In addition, the company has brought out a second generation, making the EggNest more flexible, so that when you move the image intensifier, it doesn’t get caught on the skirt. Unless you are going oblique, which may have some hindrances, most operators won’t even know that the EggNest is on the table.

**Can you share more about the importance of focusing on radiation safety in the cath lab?**

**Dr. Krishna:** I would like to give credit to Dr. Babak Azarbal, who trained me at Cedars Sinai, and who is one of the world’s leading heart failure intervention- alists. One of the biggest things he taught me early on was the power of radiation safety. When we were training, he would wear full lead over his head, arms, and legs, and teach about positioning. I was blessed to have him as a mentor, to show me the importance of not only being able to do the procedure successfully, but to protect the operator when doing these complex cases. When I was in interventional training at UCLA, my physician mentor Dr. Ramin Ebrahimi taught me the power of distance, spacing, using Radpads, and how using low fluoroscopic frame rates like 7.5 to 5 frame rates per second adds up to decreases in your radiation over 8 to 10 cases. I now do 500 to 600 cases a year and I am thinking about how much radiation I can reduce in every single case. We currently have two general cardiology fellows that rotate as part of the UT Dell Medical School. I am their main ‘radiation’

interventionalist. I train them on complex cases and how to do these cases with minimal radiation.

**How does the EggNest work for radial access cases?**

**Dr. Krishna:** Once you get access, you lift up a little shield or flaps that helps block any scatter radiation from the arm. These flaps have lead protection and put the arm in a cocoon, which, as a result, minimizes scatter to the operator’s abdominal and gonadal area. When we use radial access, we are closer to the source of radiation than with femoral access. Using the EggNest adds protection to the operator.

**What about protection in peripheral interventions?**

**Dr. Krishna:** In the peripheral cases, usually the image intensifier does not move much and remains in a static position. Critical limb ischemia (CLI) cases bring high radiation doses to the operator. Some CLI cases can take 2 to 4 hours and when you are in these static positions, it can be very dangerous, because you are getting a lot of stochastic deterministic radiation. Endovascular cases should be using this type of system where you have minimal radiation. There is no negative to using such a system, and a substantial reduction in radiation exposure, maybe up to 90% radiation protection. With the use of Zero-Gravity, Radpads, and the EggNest, my radiation is zero during the case.

**Any final thoughts?**

When we are doing interventional procedures, we should be protected and shouldn’t have to injure ourselves doing these cases. Commonly in years past, interventional cardiologists experienced neck and back pain as a result of wearing lead. My goals are not only to reduce the risks for back and neck pain, but to reduce the risks of things like cataracts resulting from radiation exposure, by using modern protective technology like the EggNest, Zero-Gravity, and Radpads, as well as imaging systems such as the Allura Clarity (Philips). It all helps us pioneer the new future, where not only do we take care of patients, but we also take care of our fellow physicians and staff. ■

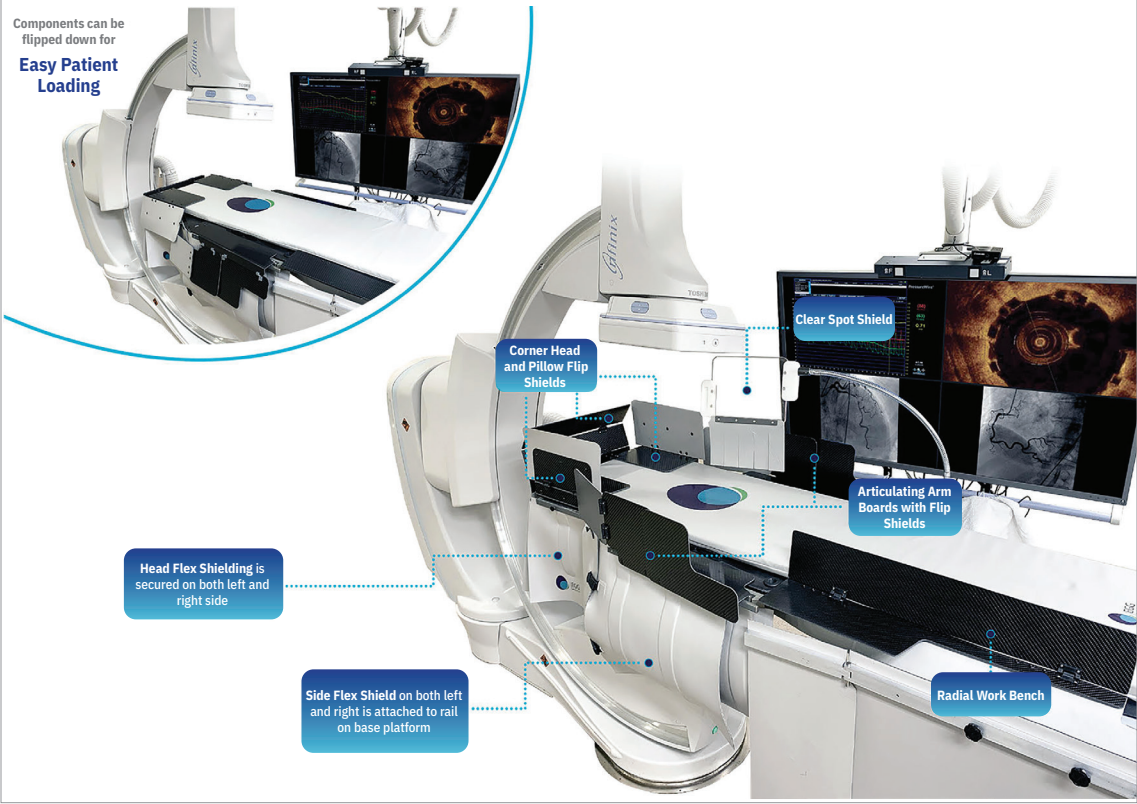
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**Figure 1.** The EggNest (Egg Medical). Top left, the EggNest with all components “flipped down”, ready for the patient to be transferred onto the table. Bottom right, all the components “flipped” up to provide radiation protection around the table.