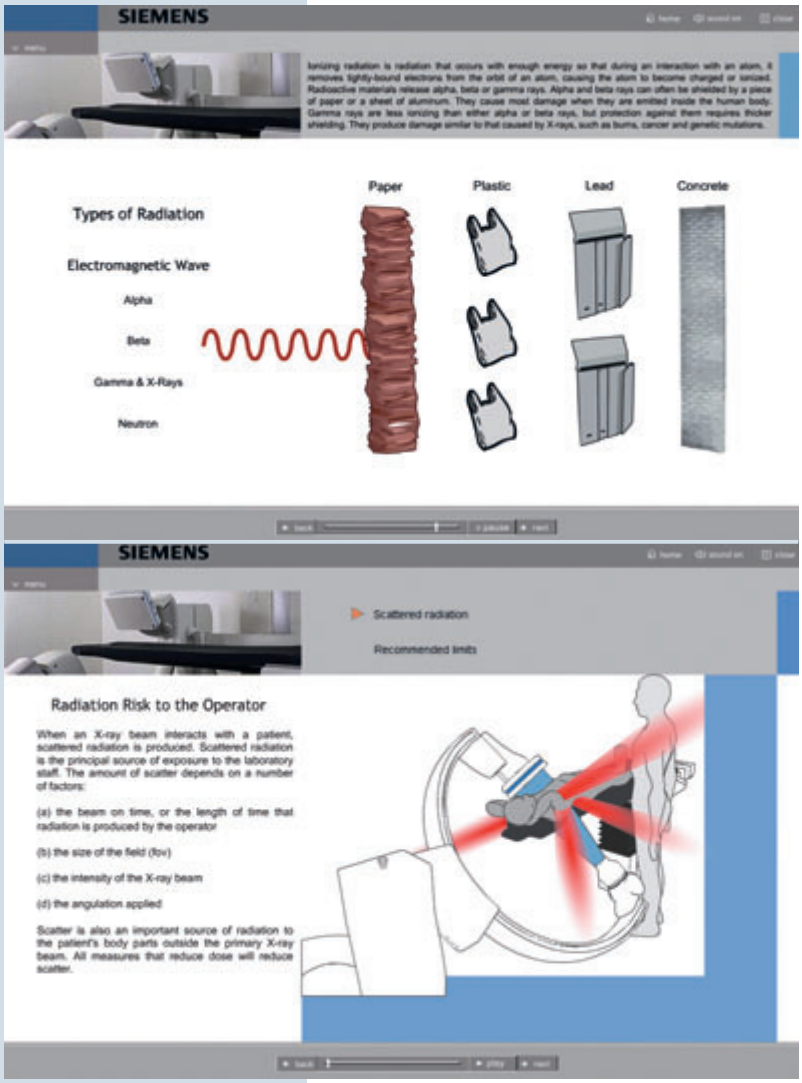
Dr. John D. Benjamin of the Morningside Clinic in Johannesburg, South Africa, developed the dose management training CD with Siemens Medical Solutions. During his many years of working and teaching in the field of interventional cardiology, Dr. Benjamin has learned the importance of creating awareness of dose protection and dose management.

Top: The interactive training starts with fundamental information about radiation

Bottom: Intuitive animations explain the effects of radiation exposure and illustrate measures to reduce dose for both patients and staff



Knowledge of radiation protection in the catheterization lab for both staff and patients is becoming more important. The effects of radiation are intangible and invisible; they are long-term and cannot be identified immediately. Dr. John Benjamin of the Morningside Clinic in Johannesburg, South Africa, has developed a training program on dose management for Siemens Medical Solutions to increase awareness of dose reduction measures.

AXIOM Innovation in Intervention had the pleasure to interview Dr. John Benjamin to gain insight into radiation reduction measures and to discover his motivation for creating this training program.

AXIOM: Dr. Benjamin, you have been an interventional cardiologist for many years. What prompted your recent interest in dose management?

Dr. Benjamin: The advent of drug-eluting stents and other advances in PCI has resulted in a marked increase in the number of PCI procedures worldwide. In addition, the number of complex lengthy procedures such as chronic total occlusions and ablations has increased dramatically, resulting in more radiation exposure for patients and operators. It has been my impression that this rapid, explosive enthusiasm has been somewhat at the expense of judicious dose management, and more importantly, there is a distinct lack of scientific data concerning the long-term effects of these newer procedures.

AXIOM: How did you learn about dose management?

Dr. Benjamin: Lectures by radiation physicists are frequently given at PCI courses, and there has been an excellent recent clinical competence statement by ACCF/AHA/HRS/SCAI which covers the subject in detail. Siemens has been very helpful in providing me with data monitored on their systems.

AXIOM: Having that experience in dose management, when did you decide to develop this interactive training?

Dr. Benjamin: I thought it would be important to share the information with my colleagues in a clear and meaningful way and looked for support for my scheme in 2004. I started the project in 2005 with Siemens Medical Solutions, because I had been impressed by the many dose-saving features on their angiocardiography systems.

AXIOM: What is your most important message with regard to dose management?
Dr. Benjamin: There are many important messages – If I had to choose, I would say a clear understanding of automatic dose regulation through the feedback system is the most important message.

AXIOM: Although you understand how radiation is generated, you still need to apply dose in order to perform diagnosis and treatment?
Dr. Benjamin: Yes, of course, there must be a dose to have an X-ray. However, you can decrease the dose quite considerably and still maintain good image quality.

AXIOM: Could you give us an example?
Dr. Benjamin: Tight collimation, decreasing the frame rate, the use of fluoroscopy rather than acquisition, radiation-free collimation and positioning using the CARE (Combined Applications to Reduce Exposure) system features, as well as using RAO projections as opposed to LAO projections where possible would be just a few examples.

AXIOM: What are the most important measures to decrease dose for patients?
Dr. Benjamin: Decreasing the "beam-on time" is the key to reducing exposure for patients. That means putting your foot on the pedal only when you have to. Additionally, less-angulated views, the avoidance of prolonged exposure at the same view, and the use of CAREPOSITION, the radiation-free positioning collimation feature, contribute to dose reduction.

AXIOM: We talked about daily radiation exposure to medical staff. What can you recommend to decrease doses for physicians and medical staff?
Dr. Benjamin: What suits the patient suits the operator as well. Decreased beam-on time, increasing distance from source, adequate upper and lower body protection as well as less-angulated views are a few examples. Of course, the ultimate in distance protection is magnetic navigation.

AXIOM: What are the risks for physicians and patients when dose management is disregarded?
Dr. Benjamin: The effects are usually classified into "deterministic" effects such as local skin burns and cataracts or "stochastic" effects, which means the risk of cancer. The latter is extremely important in pediatrics, as children are more susceptible to chromosomal damage.

AXIOM: How does your interactive training help to avoid that?
Dr. Benjamin: The training provides simple animated illustrations of X-ray function and regulation with particular reference to cardiology positioning and case management. It provides numerous graphics, which will enhance the operators' ability to apply dose-saving measures for both the operator and the patient.

AXIOM: What is the key target group for this training?
Dr. Benjamin: The training mainly aims at physicians and staff in the catheterization lab or the angiography suite. It also provides ASRT CE points for continuing education.

AXIOM: How can interested people get access to the training?
Dr. Benjamin: Siemens Medical Solutions sends this training CD to all customers who have recently purchased a new AXIOM Artis. Other interested customers can send an email to **axiom.educate@siemens.com** to receive a copy.

AXIOM: Thank you very much, Dr. Benjamin.

Dose Management CD
The dose management E-learning training is available on CD and provides ASRT CE credits.

For further information or a free copy, please contact **axiom.educate@siemens.com**

For more detailed information, send your questions to: arne.westphal@siemens.com