

**TOSHIBA**

Leading Innovation >>>

*Infinitix-i*<sup>TM</sup>  
Limitless Care







### Clinical Freedom

Clinical staff can access the patient readily and comfortably. Flexible design, optimal angle, with focus on patient comfort.

4



### Optimized Workflow

Toshiba's innovative Sequential Navigation and true multi-tasking improves the efficiency of clinical procedures, resulting in more productivity.

6



### Image Quality

One of our basic principles is that what you see is all there is to make critical decisions easier and interventions safer with absolute accuracy.

8



### Dose Reduction

Our innovative dose control tools enable clinicians to minimize radiation exposure to patients and staff, significantly, with one touch.

10



### Patient Safety

An extra assurance with wide a variety of methods to assure the integrity of life-saving, interventional procedures.

16



### Connectivity

Our designs embrace open network standards to facilitate easy integration in your hospital network and communications protocols.

18



### Clinical Applications

To navigate and deploy devices to the most complex anatomies, confidence is needed. This is supported by our versatile clinical applications.

20



### Service

We know your work. Service means to ensure and improve this, through technical maintenance, operational support and financial services.

24



### Education

We improve your capabilities with tailored training facilities, meeting the needs of your organization.

26





# Excellence for Clinicians and Patients

The cardiovascular lab is literally an extension of the clinician's eyes and hands. That's why we have worked hand-in-hand with leading clinicians to design unique features for our Infinix-i systems to address a broad range of needs, such as:

- Patient and operator safety, first of all.
- Optimized patient access and full anatomical coverage.
- The best image quality at the lowest dose.
- The highest workflow efficiency to enhance clinician performance.

## **Innovation for Quality of Work and Life**

With X-Ray as the oldest of diagnostic imaging technologies, we aim to innovate continuously. Our Infinix-i series combines superb image quality, an unparalleled range of access for clinicians and comprehensive dose management features. Answering the latest demands in clinical imaging, the systems are fast, safe and precise. Our dedicated and diverse system configurations cater for a wide range of applications.



Clinical Freedom

# Freedom at Work

*Unique C-Arm  
Movement and  
Full Anatomical  
Coverage*

As a result of careful study and interaction with leading clinicians, the development of multi-access floor- and ceiling-mounted C-Arm positioners give optimal patient access from all sides. Indeed - Clinical freedom without any compromise in projection flexibility.

### **Optimal Patient Access is Key**

Increasingly complex procedures increase the risk of emergencies and difficult interventions are now frequently performed under anesthesia. In addition, the use of hybrid procedures is growing, with the widespread introduction of new techniques. Optimal patient access has become key in interventional imaging. This is reflected in development of our Infinix-i series.

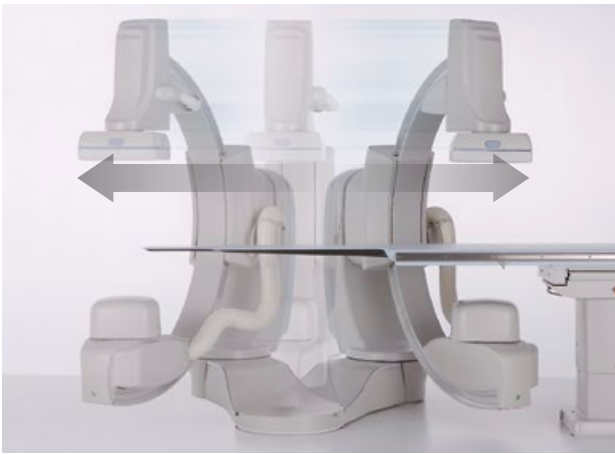
### **Get Access**

Flexible C-Arm positioning for unlimited access without angulation restrictions.



### Full Coverage

Maximum anatomical coverage of 201 cm without moving the patient or table.



### Lateral Stroke

Optimal approach for radial approach and implantations.



### Reduce Dose

Reduction of lateral scatter (up to 50%) and skin dose (up to 17%) by inverting lateral C-Arm orientation.

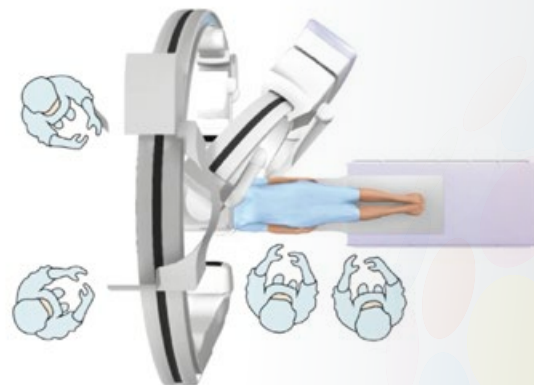


Reverse



### Best Patient Access Possible

Unique 270° movement of C-Arm. Free head space for anesthesia and patient access in general.





## Optimized Workflow

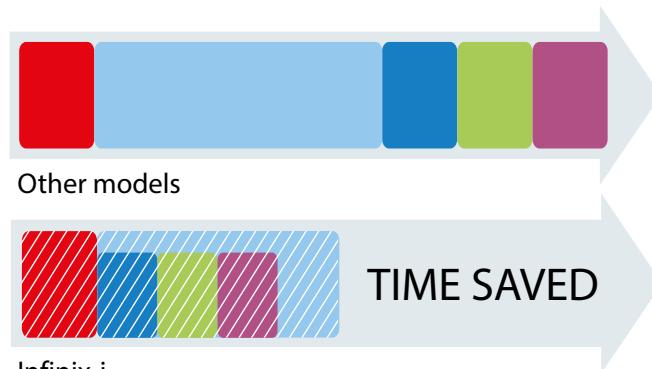
# Performance meets Intelligence

### *Parallel Imaging*

Toshiba's 'parallel processing' stands for true multi-tasking. Processing and transferring image data simultaneously during acquisition results in quick and efficient examinations. During fluoroscopy and fluorography, for example, operators can prepare for the next scheduled patient, process and save images from a previous, or current study. And at the same time, transfer, or archive images to an associated network.

### The advantages of parallel processing

For One Procedure



Infinix-i

time lapse



• parallel and background processing



• patient registration  
• retrieve archived images



• fluoroscopy and radiography  
• playback and display



• filming and analysis



• image storage



• HIS/RIS feedback





### **'One Touch' navigation**

Sequential Navigation also enables physicians to quickly navigate through an examination and to execute the preferred angles, projections and acquisition parameters, all from memory. One button only is required to run through the routine settings for each examination type. Any number of examination types can be stored for any number of operators. This unique feature dramatically boosts productivity and is very 'operator friendly'. Without disrupting Sequential Navigation, the operator can customize the most important parameters, including:

- C-Arm position and angulation.
- Table height.
- Source-to-image distance.
- Compensation filter settings.
- Acquisition rate.
- Image size.
- Field of view.
- Generator settings.
- Digital processing.



## Image Quality

# Superior Imaging, Better Outcomes

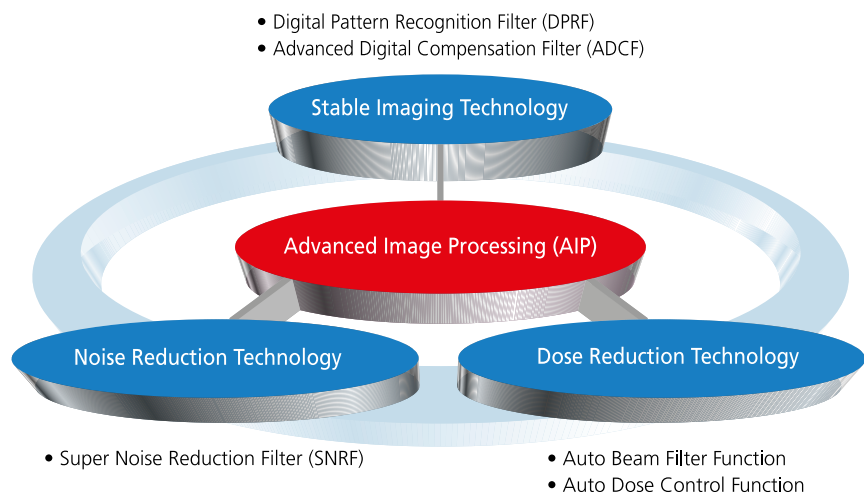
*Unparalleled Clarity  
with Advanced Image  
Processing*

Toshiba wants to help you make critical decisions easier and interventions safer and faster. With absolute accuracy, our unique Advanced Image Processing (AIP) concept provides outstanding image quality for visualization of vessels and devices. AIP is the true alignment of:

- Stable Imaging Technology.
- Dose Reduction Technology.
- Noise Reduction Technology.

For example, the Super Noise Reduction Filter reduces image noise without requiring the X-Ray dose to be increased, by recognizing and reducing noise components in each individual image frame.

Advanced Image Processing (AIP) provides superb image quality for visualization of vessels and device.



## What You See Is All There Is

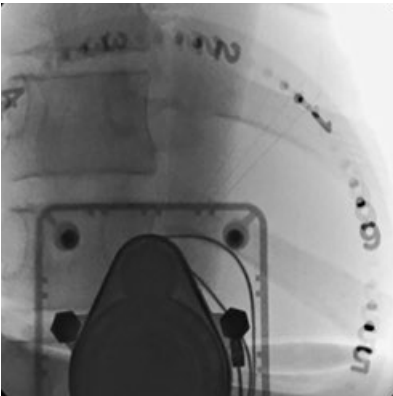
Our aim is that you see more than ever. The Infinix-i Series accommodates a wide range of procedures. Advanced conventional- and 3D imaging technologies provide unprecedented imaging with unique tools to enhance diagnostic and interventional procedures, supporting the clinician's overall treatment planning capabilities.

## A Clear Difference

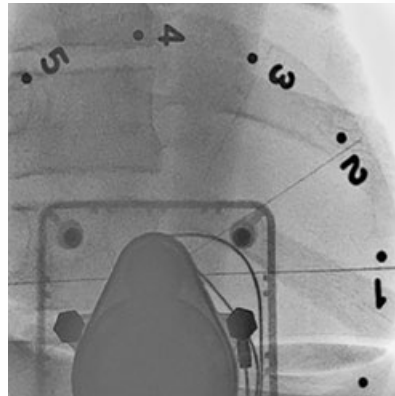
The following examples show the difference between conventional- and Toshiba's imaging quality:

### AIP (Advanced Image Processing)

Without AIP

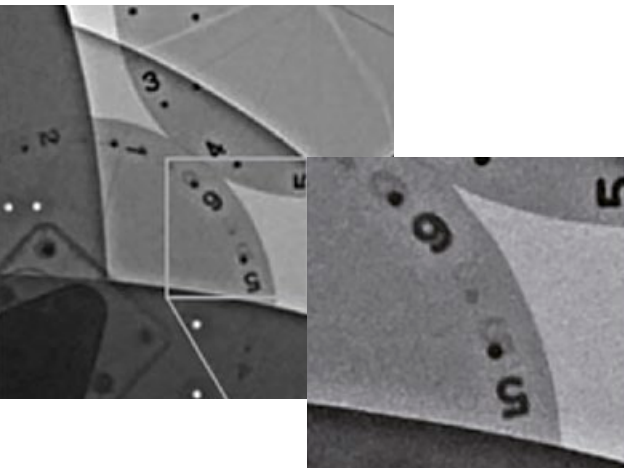


With AIP

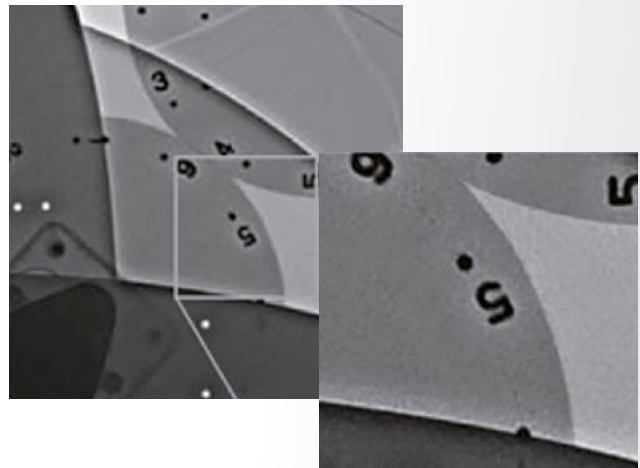


### SNRF (Super Noise Reduction Filter)

Conventional



SNRF





## Dose Reduction

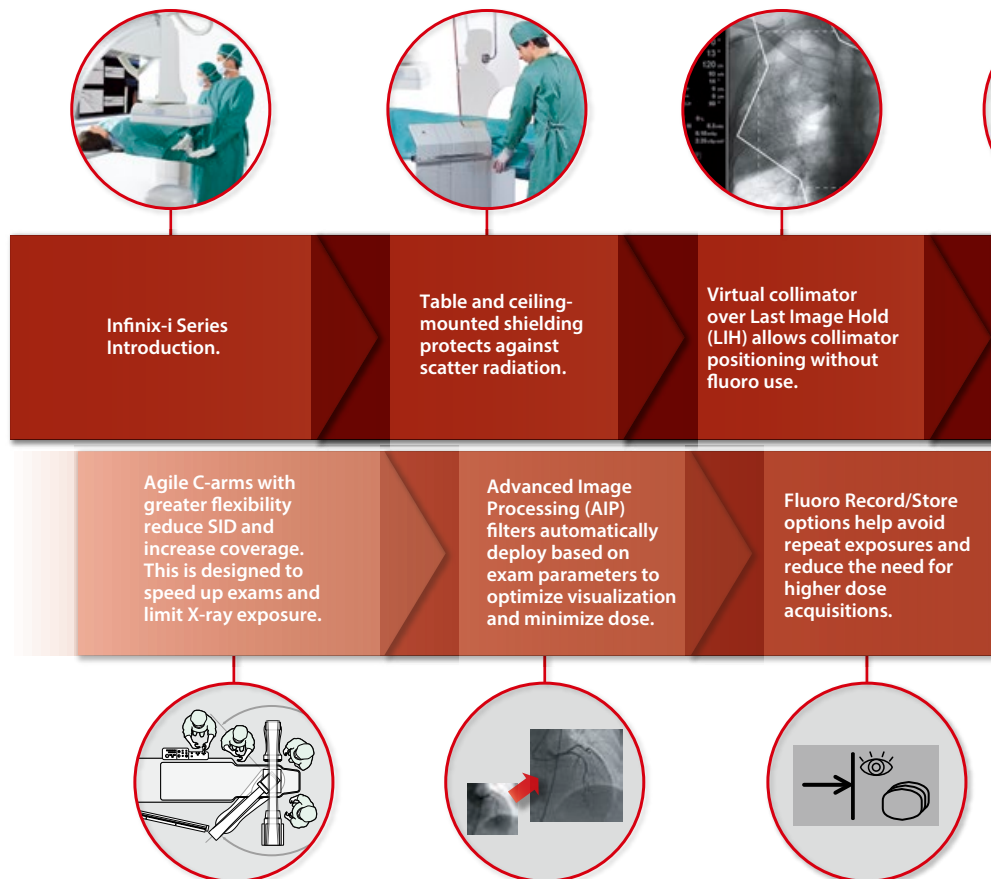
# Spot on Low Dose

*Minimum Exposure,  
Maximal Image Quality*

How to achieve outstanding image quality with minimum exposure dose for patients and operators? Toshiba always has the ambition to give the best and complete answer to this major topic. That's why we provide many unique dose reduction features as part of our standard configurations.

### **Dose Reduction for Patient and Operator**

Our most convenient feature is real-time dose tracking, making it possible for the operator to observe dose levels on a digital display in examination and control rooms. This is also the starting point for monitoring and managing dose reductions functionalities, such as:



**Infinix-i Series Introduction.**

**Table and ceiling-mounted shielding protects against scatter radiation.**

**Virtual collimator over Last Image Hold (LIH) allows collimator positioning without fluoro use.**

**Agile C-arms with greater flexibility reduce SID and increase coverage. This is designed to speed up exams and limit X-ray exposure.**

**Advanced Image Processing (AIP) filters automatically deploy based on exam parameters to optimize visualization and minimize dose.**

**Fluoro Record/Store options help avoid repeat exposures and reduce the need for higher dose acquisitions.**

## X-Ray Beam Filter

The beam filtration can dramatically reduce patient dose and scatter radiation. Beam filtration can be automatically adjusted to the imaging conditions and clinicians can select the mode for the optimum dose reduction and image quality from the tableside.

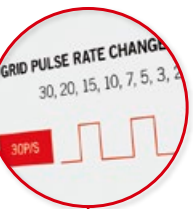
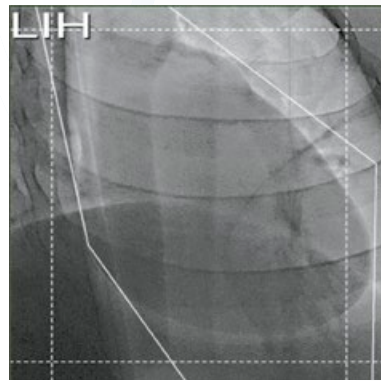
## Variable Dose Mode

The operator can choose from four pre-programmed fluoroscopy modes with the touch of a tableside button. The various study protocols are optimized by different combinations of pulse rates, dose level and image processing parameters.



## Virtual Collimation and Filtration

After fluoroscopy, virtual collimation uses software to simulate collimator and filter positions. If the radiation dose will be further reduced, operators can adjust collimation without additional fluoroscopy.



Grid Pulsed Fluoro provides efficient use of X-ray combined with varying frame rates to optimize dose.

Compact tableside control enables dynamic operation of critical dose functions.

Flat Panel Detectors (FPD) accelerate exams with high-resolution imaging and decrease Source to Image Distance (SID) to reduce dose requirements.

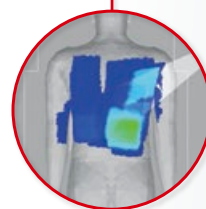
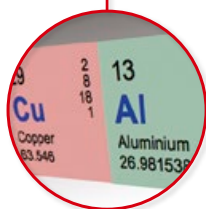
Live Zoom digitally magnifies up to 2.4 times at lower doses than traditional magnification mode or field of view change.

Structured Dose Reporting retains a detailed dose summary with patient images to provide reporting output.

Up to 5 filter collimator automatically selects copper and aluminum filtration to optimize dose and IQ for each clinical case.

Spot Fluoroscopy utilizes an "invisible" collimator over LIH to provide live fluoro to a targeted area while retaining the overall field of view.

Dose tracking system provides visual guidance as to where radiation is being applied and how much.



## Fluoroscopic Acquisition

During fluoroscopy, the operator can capture still and dynamic images for future reference. This results in a substantial reduction in exposure dose, while the archived images provide an alternative for radiography.

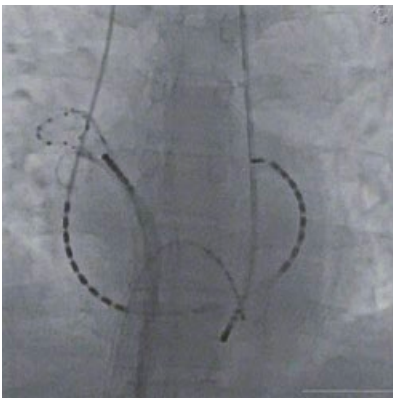
## LIVE Zoom

By using the electronic zoom, the dose can be reduced by more than 30%. Images are digitally enlarged without increasing the dose, eliminating the need to use smaller fields of view on the detector for magnification purposes.

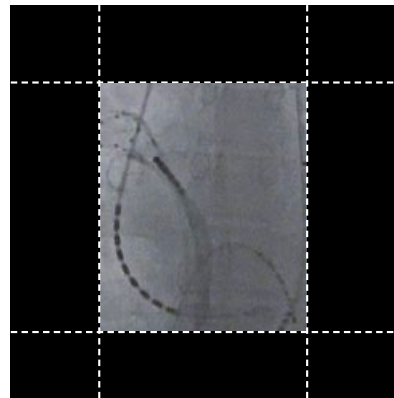
## SPOT Fluoroscopy

### Save Dose While Retaining the Overview

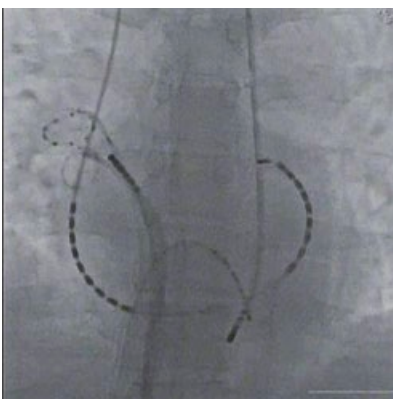
Traditional Fluoroscopy



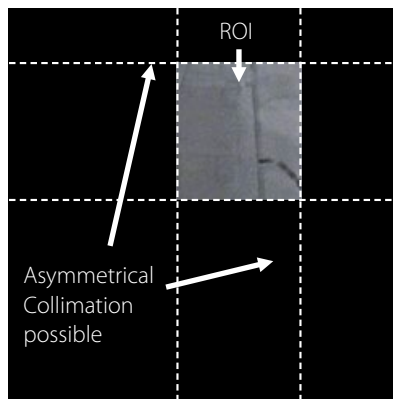
Only Symmetrical Collimation possible



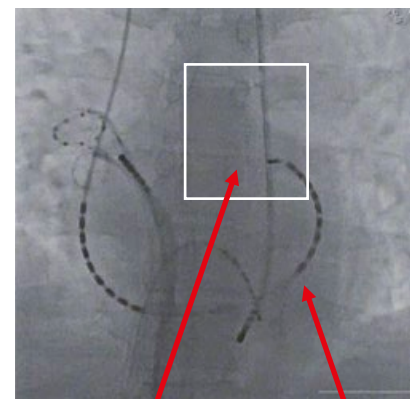
Traditional Fluoroscopy



SPOT Fluoroscopy



SPOT Fluoroscopy image display



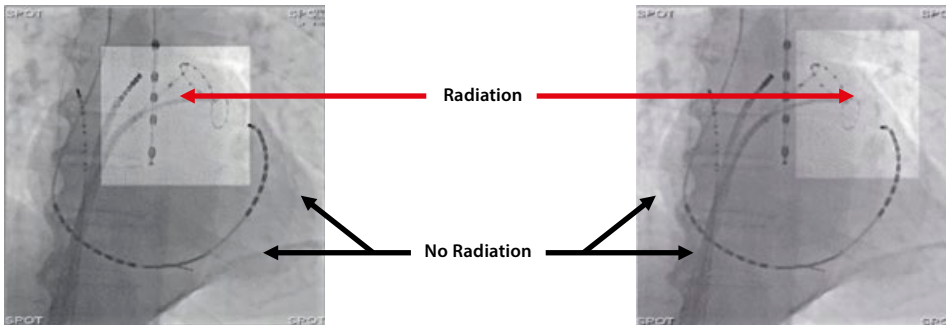
ROI-Size/Position can easily be adjusted by Joystick at table side.

### Spot the Target and Save Dose

Intelligent dose saving techniques are key to minimize risks for both patients and operator during complex interventional procedures. SPOT Fluoroscopy is a unique combination of innovative asymmetric collimation capabilities and a novel exposure management technique.

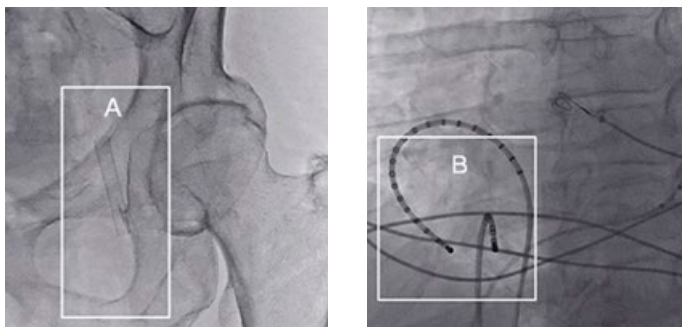
### Enhance Flexibility and Reduce Panning with Asymmetric Collimation

Spot size can conveniently be controlled at the tableside. Just place two reference points anywhere on the Last Image Hold (LIH) to define the size and position of the spot region desired. The collimator automatically and instantly adjusts and the LIH is displayed around the spot region during fluoroscopy. The spot region can be repositioned, or resized, at any time.



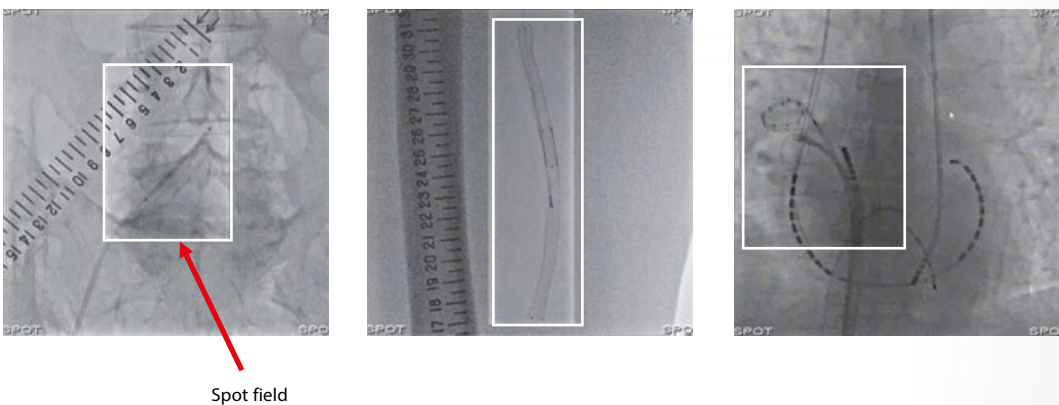
### Less is More

This new Exposure Control technique implements collimation adaptively and maintains a constant skin dose, independent of the collimated spot size. As a result, Dose Area product saving is inversely proportional to the spot size. Applying SPOT Fluoroscopy not only saves dose, but also improves image quality, by significantly reducing scatter radiation.



Both 20cm<sup>2</sup> FOV  
Spot size A - 20% area = 80% reduction in DAP  
Spot size B - 20% area = 80% reduction in DAP

### Clinical examples



Spot field

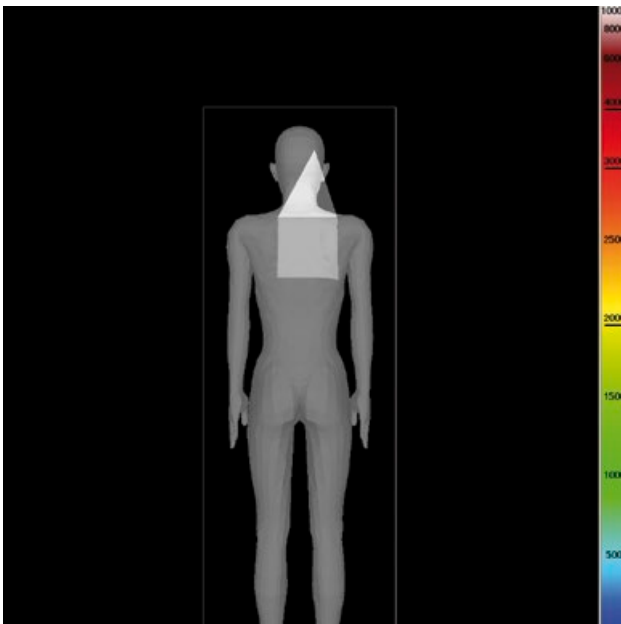
## DTS (Dose Tracking System)

### *Keep up your Maintain Awareness*

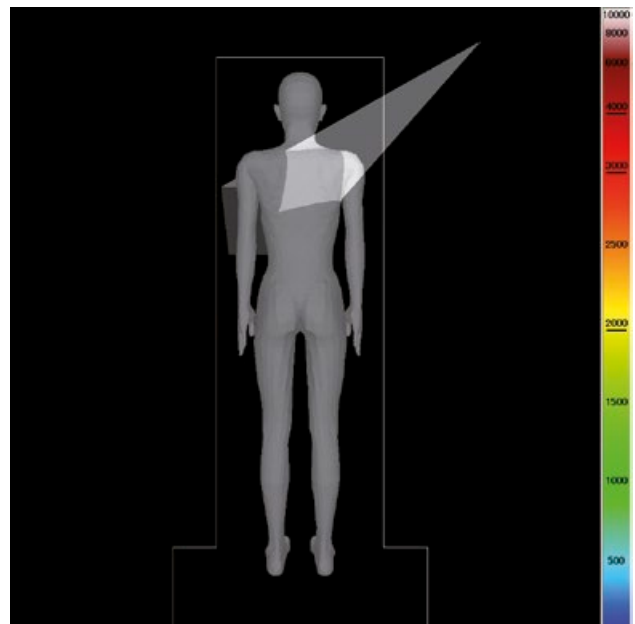
Dose Tracking System (DTS) is a dose awareness tool that provides estimated dose information for the patient's body surface in real-time. It supports selective catheter angiography for heart, chest and abdomen.

The software calculates the peak skin dose at the patient model surface based on the actual measurement dose at the interventional reference point.

The exposure dose information on the patient surface is displayed, as well as the study information and the patient information. The X-ray direction and radiation area is linked to the real C-Arm projection and updated in real-time. This data can be used as reference information to prepare for the next exposure, so that regions showing high exposure dose are excluded from the exposure range.

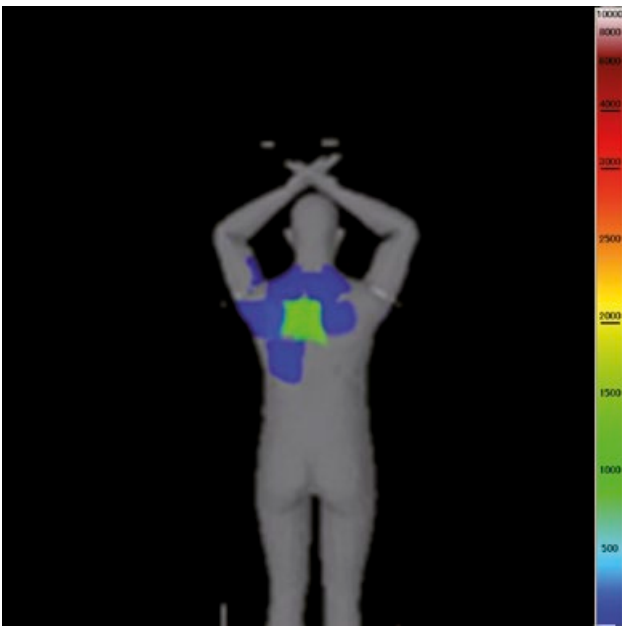


The X-ray beam direction and radiation area is linked to the real C-Arm projection and updated in real time.

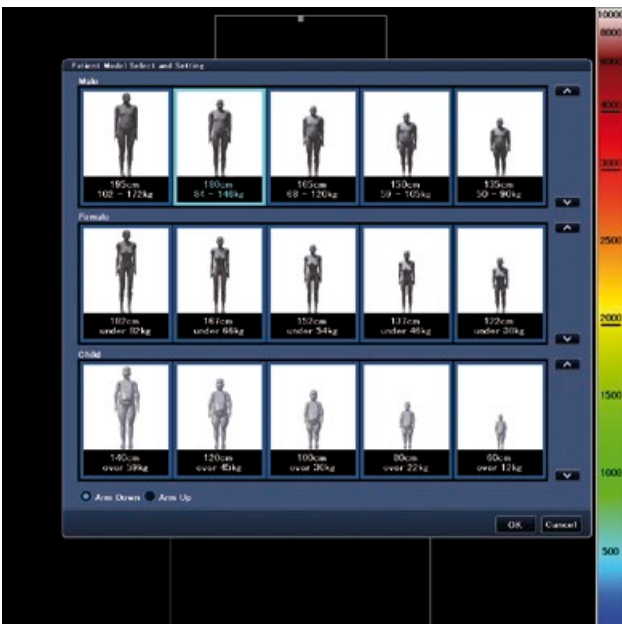


To show direction and radiation area linkage.





The exposure dose increases in order from blue, cyan, lime, yellow, red, and maroon to white and is also displayed as color map on the patient model. The PSD (PSD: Peak Skin Dose) threshold value can be defined by the user. A report can be generated at the end of the examination.



Multiple 3D patient models are defined in advance and a patient model is selected for each study.



## Patient Safety

# Focus on Procedure Integrity

Unobstructed examinations that focus on patient safety. Through the years, Toshiba has developed tools to ensure safe treatment. Besides the significantly lowered dosage and quicker and better image delivery, the Infinix-i systems are equipped with tools and 'redundancy features' for uninterrupted and safe examinations. Here are some examples:

### Tablesides Controls for Greater Confidence

We call it the Hyper Handle, a compact, tableside control unit that supports operation of system functions, while minimizing ergonomic stress. Intuitive and easy to use, the clinician can drive the system by touch, while remaining focused on the patient and procedure. Preferred settings for a number of operators can be stored, including features, such as sequential navigation and rotational imaging.



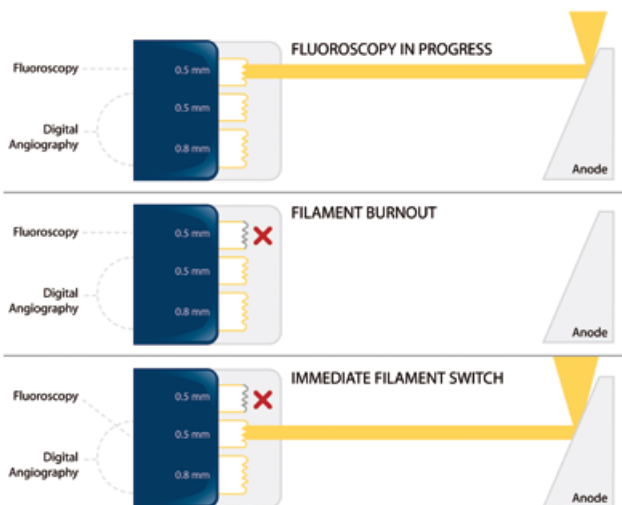
## Double Safety, Half Risk

Designed with the focus on patient safety and comfort, some smart features of the Infinix-i Series, include:

- Double Inverter Generator  
If one of the inverters fails, the system can continue to function with reduced power.
- Backup Focus  
When one focus fails, the second focus automatically takes over without any interruption.
- RAID 5 Archiving Platform  
Advanced archiving technology is applied compliant with the highest safety standards to store clinical images without any risk of data loss.

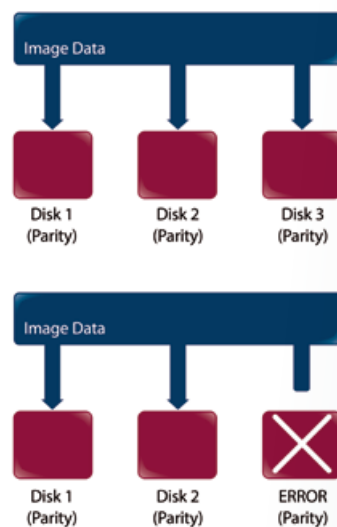
## Backup Focus

If one focus fails, a second automatically takes over without interruption.  
Double safety means half the risk.



## RAID 5 Storing Platform

Advanced archiving technology for the highest safety standards. PACS Data Safety at System Console. Storage without the risk of data loss.





## Connectivity

# Productivity Unlimited

*Efficient Workflow  
and Access  
to Patient  
information*

Toshiba's global network of Connectivity Centers provides support services on network connectivity and product inter-operability between Toshiba and other systems. Our consultancy services and IT project advice are based on our extensive expertise in the communication standard, DICOM, and the interoperability initiative, IHE.

### **'Best Of Breed' Network Integration**

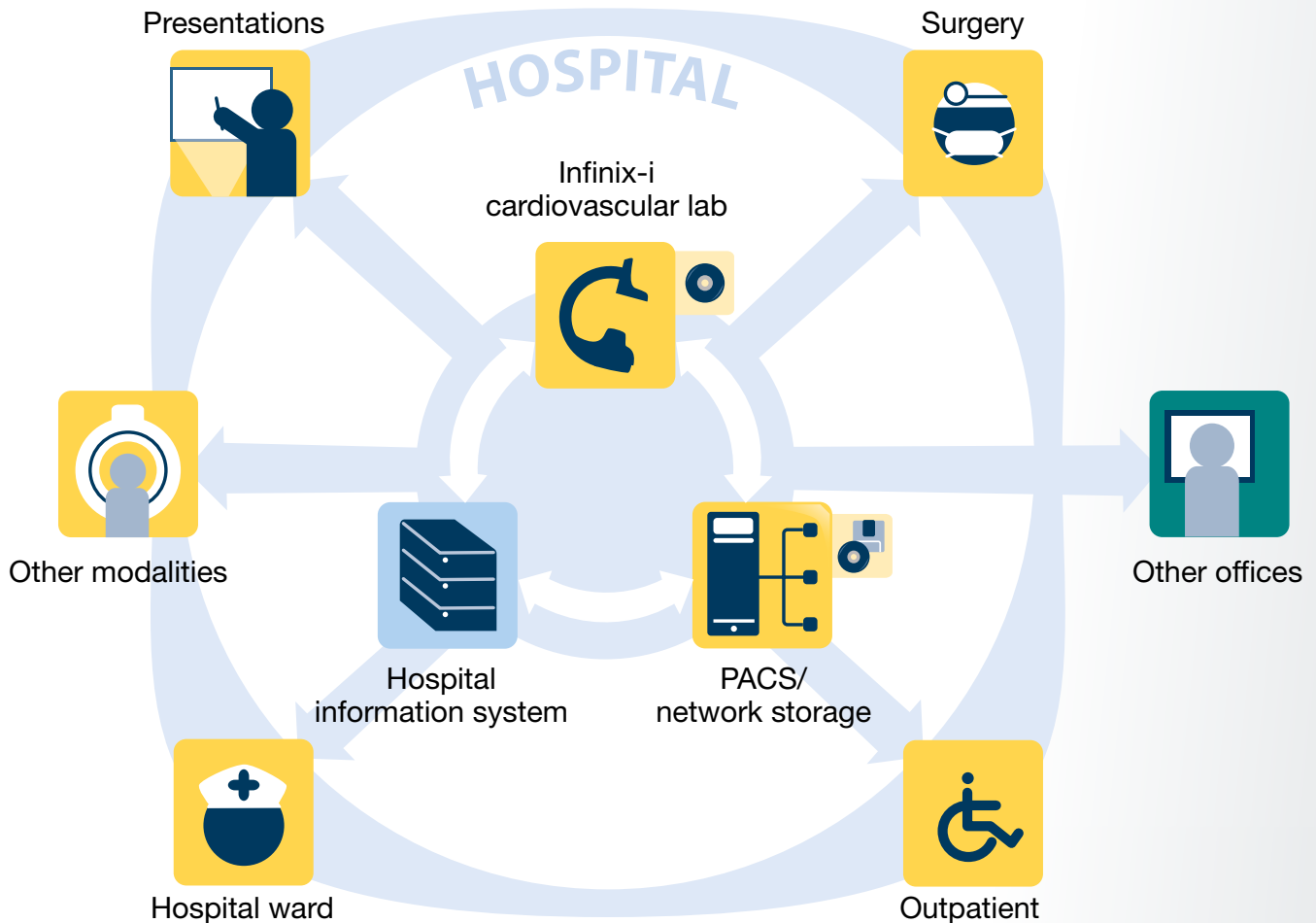
The Infinix-i Series is delivered with all major DICOM Service Classes as standard, enabling efficient network integration. This brings great advantages:

- Open access to patient information.
- Reduction in examination time.
- Enhanced efficiencies in overall departmental workflow.

For example, operators can easily enter and store patient registration information before a procedure. They can access the patient information database and retrieve previous studies from the archive to compare these with the current examination.



## Connectivity and Productivity: the complete picture



**Infinix-i:** Dynamic viewing and flexible network integration permits rapid export and retrieval of images. Open communications with HIS/RIS provides rapid transfer of patient information.



**Presentations:** Clinical data can be exported as PC format files for use in presentations.



**PACS/network storage:** Provides online dynamic review of patient images. Storage and transfer of multi-modality images are handled at high speed.



**DICOM CR-R/DVD+-R:** Serve as long-term and portable storage media for valuable image data.



## Clinical Applications

# Versatility in Every Aspect

### *Most Effective Device Guidance*

The Infinix-i series has an unparalleled number of clinical applications. To navigate and deploy devices through the most complex anatomies, the possibility of visualizing and overlaying 2D live fluoro with the matching 3D-data set brings more confidence. In the extension of this, a great number of techniques are available, such as:

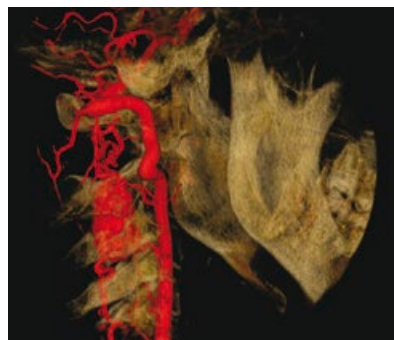
- **3D Roadmap:** using contrast injected 3D-data set from rotational angio.
- **Multi-Modality Fusion:** using 3D-data set from CT and MR.
- **Needle Guidance:** using non contrast enhanced CT-like 3D-data and CT set for puncture guidance.

### **Versatile Techniques Lead to Useful Application**

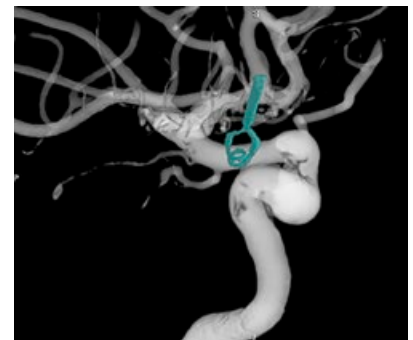
The most important applications are:

Better understanding of the relationship between bone/vessel and device/vessel close to the lesion for safer therapy strategy.

#### 3D Bone Fusion

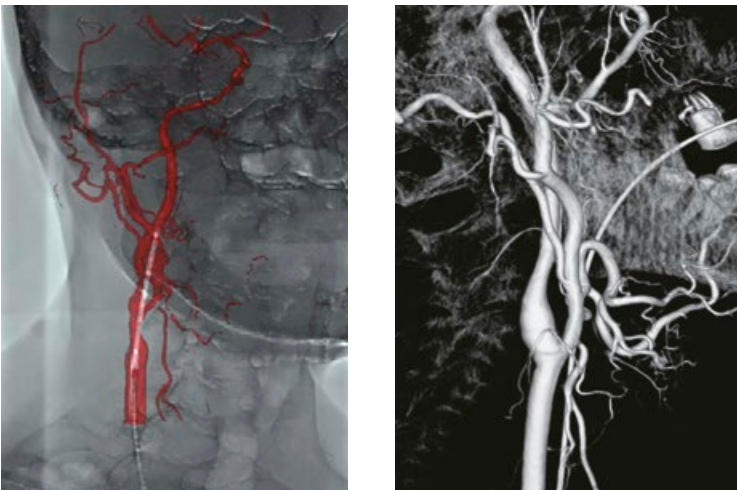


#### 3D Device Fusion

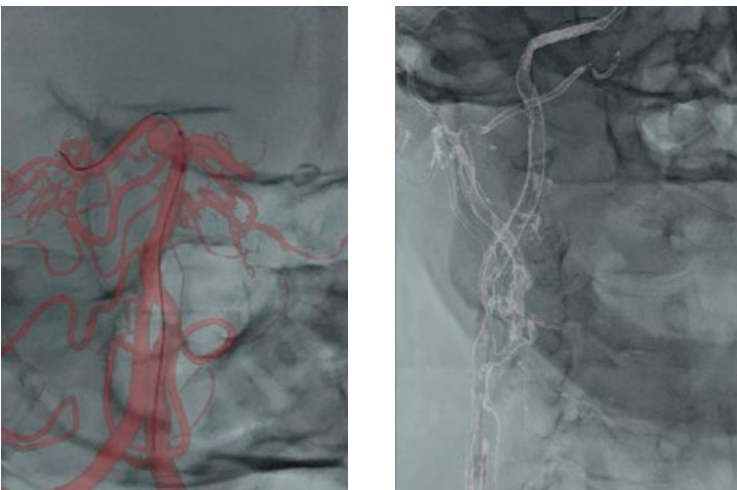


High-speed acquisition generates conventional 3D reconstructions and unique display capabilities as Device Fusion, which clearly differentiates devices from vessels. Bone Fusion technology is also available, allowing simultaneous display of vessels and body landmarks.

### 3D Roadmap

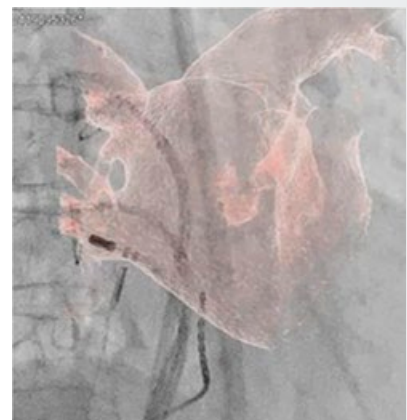
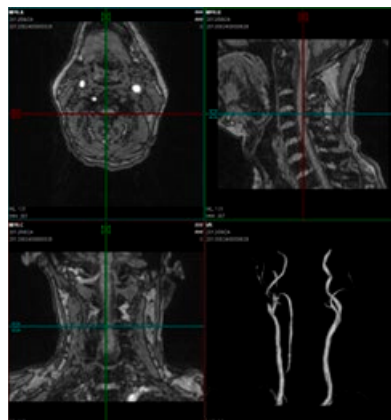
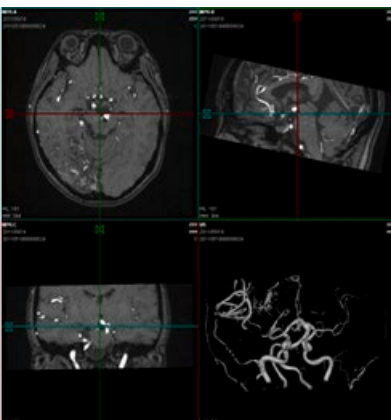


Volume Navigation of an interventional carotid stenting.

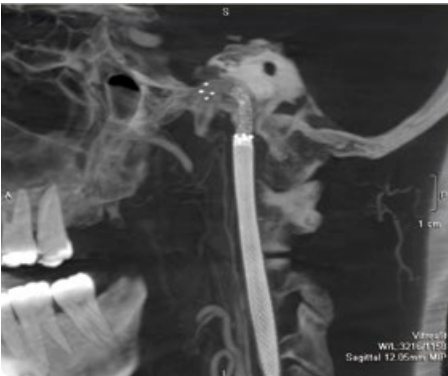


All system movements are linked with the fusion 3D and fluoroscopic display. This reduces the risks associated with repeat 3D acquisitions during the procedure, ensuring safer interventions and more confident decision-making during difficult situations.

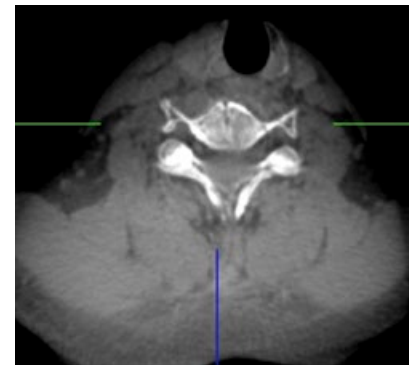
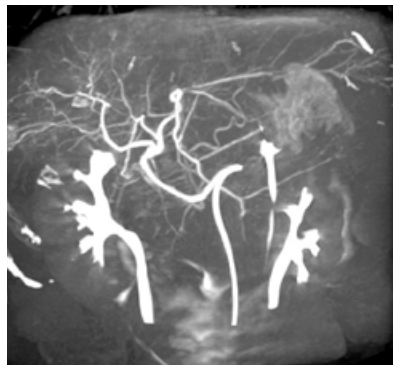
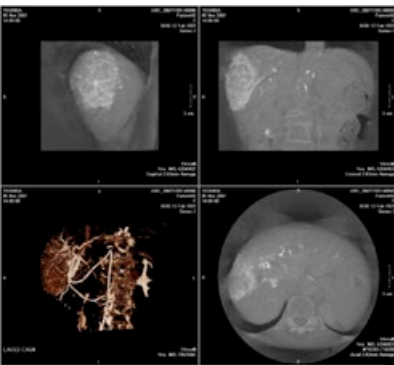
### Multi Modality Roadmap



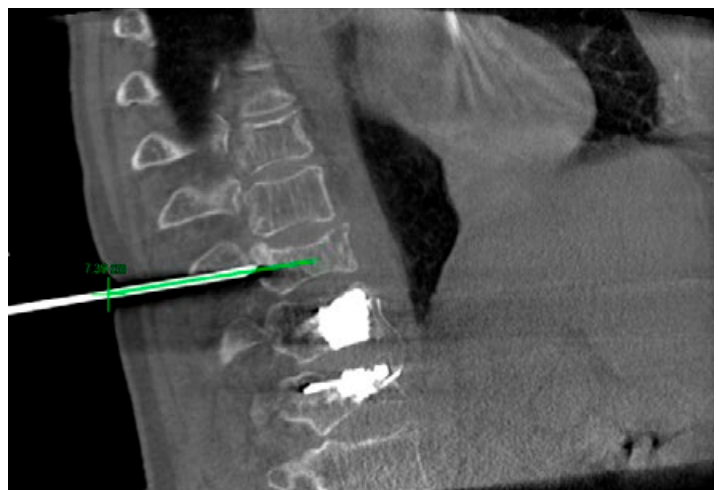
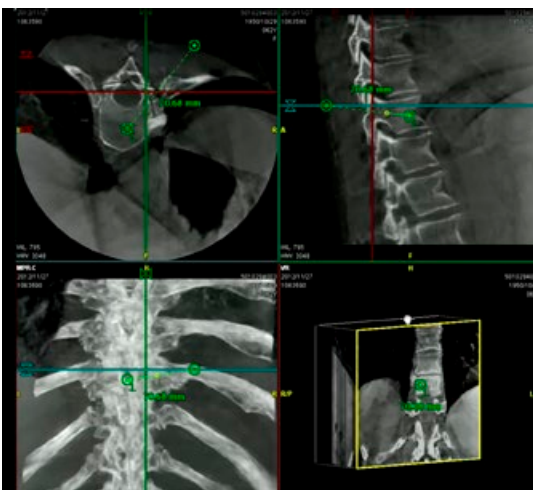
## LCI - CT Imaging



To supplement 3D imaging, CT like Imaging is available to support target visualization of anatomy or pathology during interventional procedures. Infinix-i systems utilize Low Contrast Imaging (LCI) to provide a well-visualized view of three overlapping carotid/cerebral stents of varying radiopacity.



## Needle Guidance





## Dynamic Trace

See vessels quickly and clearly without subtraction using the interactive, one-injection Bolus trace image acquisition technique. Real-time visualization of vessels over bones and anatomic landmarks with up to 60% lower dose than standard DSA technique.

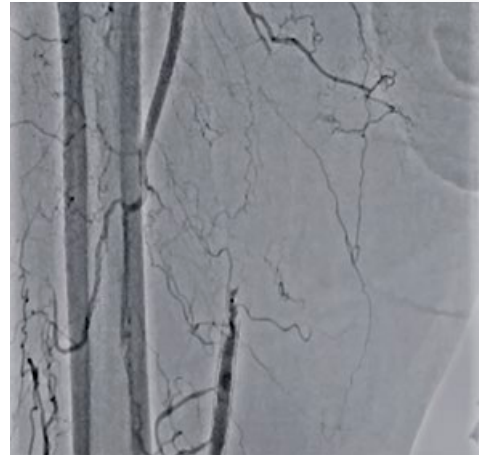
Applicable to arterial or venous techniques. Smart exposure management algorithms avoid over-, or under exposition of the target anatomy. No wedge filter or filter mattresses are required. Special Image processing is applied to suppress anatomical background, while enhancing the vessel contrast. Just inject and follow the contrast bolus by moving table top or C-Arm. Speed can interactively be adapted to the flow situation inside the vessel. No motion artifacts issues.



## Phlebography of subclavian vein



## SFA total occlusion



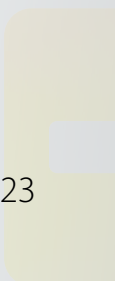
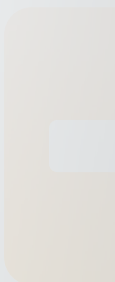
## Arm fistula



## Single leg run off with only 14ml contrast medium



Excellent visualization of tiny vessels up to the skin edge without any blooming artifacts.





Service

# Delivering a Superior Experience

*InnerVision for Remote Diagnosis of Your System*

Optimization of 'uptime' and providing uninterrupted operations. Our services are designed to improve your work. One of the most innovative concepts is Toshiba's InnerVision for the remote diagnosis of your system. InnerVision represents the next generation of service, translating prevention into proactive support and quality assurance. When a problem is detected, our highly dedicated services staff is standing by to perform online diagnostics to identify and resolve the issue quickly and efficiently.





### **Extra Assurance with Proactive Support**

InnerVision monitors your imaging equipment periodically to ensure it delivers clinical excellence day-by-day. It helps to prevent unscheduled downtime and to solve eventual problems in a quick and effective way. Some useful examples of what the InnerVision concept means to your organization include:

- Automated predictive diagnostics alert us to a potential issue before it becomes a problem.
- Proactive monitoring helps to minimize costly downtime (and the need to reschedule examinations!).
- In case of an issue, our Standbyou technical specialists can immediately connect to start diagnosis.
- Our experts can explore solutions on-line. This frequently resolves an issue without the need for on-site service. In other words: saving time and money.

The combination of InnerVision remote services and the expertise of our dedicated service team can boost your productivity. And, moreover, employee satisfaction in your operating team!





Education

# Adding Value to Your Investment

*Welcome to  
Toshiba's Training  
Academy!*

Learning the 'ins and outs' of equipment equipment and processes. Tailored, fast and efficient. The Toshiba Medical Systems Europe Training Academy provides the most cost-effective way to improve the capabilities of people working with Toshiba's Infinix-i Series and other Toshiba products.



## **Educational Services: Groups and Individuals**

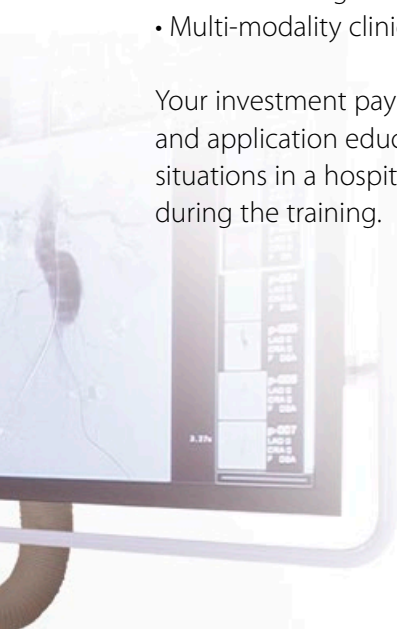
The training programs of the Academy are developed by clinical and system experts. They have first-hand knowledge of Toshiba imaging systems and they know, to say it simply, your work. Members of your staff, whether groups or individuals, can learn all the 'ins and outs' of the system and put them into practice immediately.

## **Dynamic Training, Quick Results**

The Academy is specialized in dynamic, computerbased training. You will work closely together with our experts, increasing your access to the most advanced training tools and system features. Methods are, for example:

- Powerful and interactive 'hands-on' training in our X-Ray Demo Center.
- A realistic and uncomplicated learning environment with expansive 'Clinical Settings'.
- Multi-modality clinical applications training.

Your investment pays off almost immediately because our technical and application education programs are geared toward real-world situations in a hospital environment. People 'prepare for action' already during the training.



# The Same with Less, or More with the Same

As one of the world's foremost eco-companies, we strive to create environmentally-conscious products for a sustainable Earth. Toshiba's environmental history goes back to 1975, when plans for an eco-friendly factory were developed. This can also be seen as the start of the development of ECOstyle.

## Greening of Processes and Products by Technology

The shape of the ECOstyle logo symbolizes the three cornerstones of Toshiba's environmental management system:



### GREENING OF PROCESSES

Supported with 40 years experience in deploying highly efficient manufacturing facilities and processes that minimize environmental impact.



### GREENING OF PRODUCTS

Our key focus is on less energy consumption and/or more functionality. Alternative materials, weight reduction and designed with a 'second life' in mind.



### GREENING BY TECHNOLOGY

Toshiba's extensive knowledge, also on a corporate level, in the field of Energy Technology, includes energy regain, using improved resources, battery efficiency, solar energy and many more areas of expertise in sustainable energy consumption.



### **Making ECOstyle Easy and Profitable**

These days, sustainability is essential. With ECOstyle, Toshiba makes it easy to comply with legal and social standards. ECOstyle is measurable and profitable and offers clear benefits, such as:

- A longer product life. We develop products with the future in mind, anticipating on legislation. Our products have a higher residual value and are designed to be fit for a 'second life'.
- Our products are designed to save energy and floor space, resulting in a lower energy bill and optimized use of available space.
- Designed with modularity and mobility in mind. Sharing equipment and 'use only what is needed' are now challenging issues in the health industry. We help to anticipate your flexibility needs.
- When your systems are really at the end of their life cycle, we take the full responsibility to dismantle them in a sustainable way.

### **Roadmap to Green Hospital**

With ECOstyle, sharing knowledge is a key success factor. In many European countries, hospitals and institutions are advancing their green policy, often aiming to reach the status of Green Hospital. We help with knowledge, innovation, systems and products. Our ambition is to be the preferred partner in sustainability and to work on the continuous improvement of ECOstyle.

# Global Innovation by design

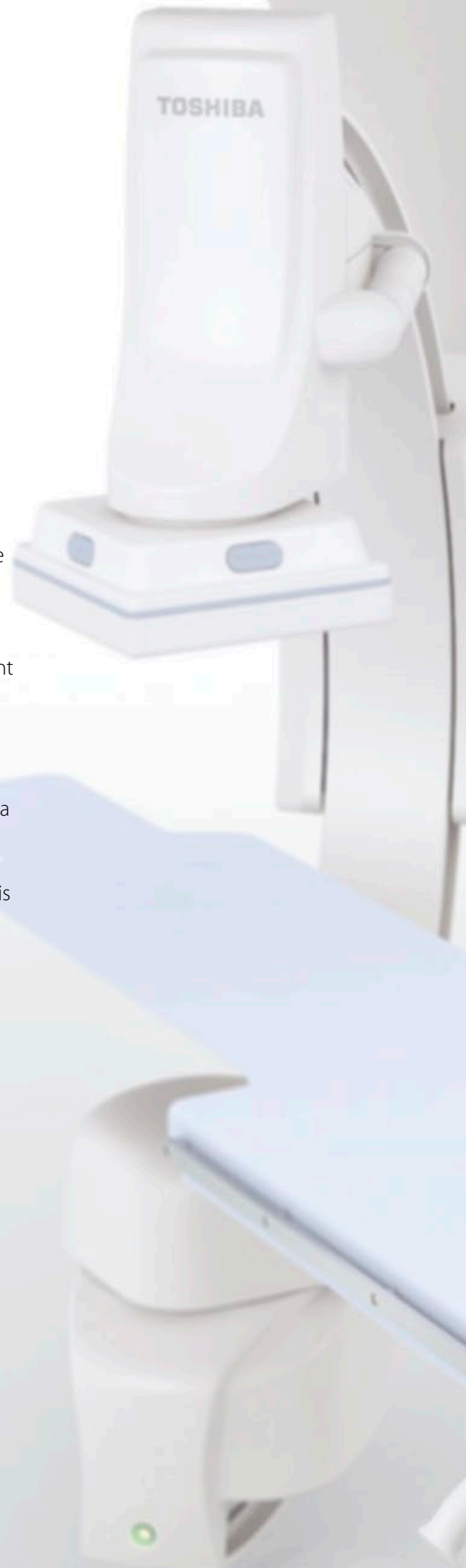
Improve the health and welfare of people around the world. That's the Limitless care mission and result of 130 years of Toshiba's research and development. Nowadays, Toshiba Medical Systems offers a full range of diagnostic imaging products. We are a partner for hospitals and institutions in more than 110 countries. Our 'Made for Life' commitment stands for continuous innovations that improve patient care and provide lasting quality.

## **Innovation and Environmental Vision 2050**

Caring for the Earth and its people is at the heart of everything Toshiba does. This passion is enshrined in our Environmental Vision 2050, in which, we seek to improve our eco-efficiency by a factor of ten over the next four decades. The three cornerstones of ECOstyle are the basis for the realization of this ambition, monitored by tangible milestones year by year. Needless to say, this goal will challenge our innovative power to its maximum capacity.

## **More Progress in Partnerships**

Quality in design, manufacturing, production, focus on optimizing energy efficiency and the 'second life' and recycling of equipment. These are traditional and well-known success factors in achieving sustainability. To reach our ambition of the Environmental Vision 2050, we need more. In other words, we cannot realize these ambitions alone. It's our belief that innovation processes will be far more successful in close and open cooperation with our partners, sharing ideas, knowledge, experience and resources. We'll take the initiative and you are invited!







# Leading Innovation

1875 Toshiba founded	1998 First quiet MRI	2009 First premium handcarried ultrasound system
1915 First X-Ray tube	2000 First all-digital multipurpose X-Ray	2010 First hybrid angiography system with tilting catheterization table
1973 First realtime ultrasound scanner	2003 First 64-slice CT scanner	2011 First ultrasound system with Fly Thru technology
1989 First helical CT scanner	2005 First compact dual-plane cath lab	2012 Adaptive Iterative Dose Reduction AIDR 3D for all new CT scanners
1990 First tissue Doppler imaging system	2006 First 5-axis C-arm cath lab	2012 First Spot Fluoroscopy
1993 First realtime CT fluoro	2007 First dynamic volume CT scanner	2013 First real-time dose tracking system



## TOSHIBA MEDICAL SYSTEMS EUROPE

[www.toshiba-medical.eu](http://www.toshiba-medical.eu)

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Toshiba Medical Systems Corporation Nasu Operations meets the Environmental Management System standard, ISO 14001.

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