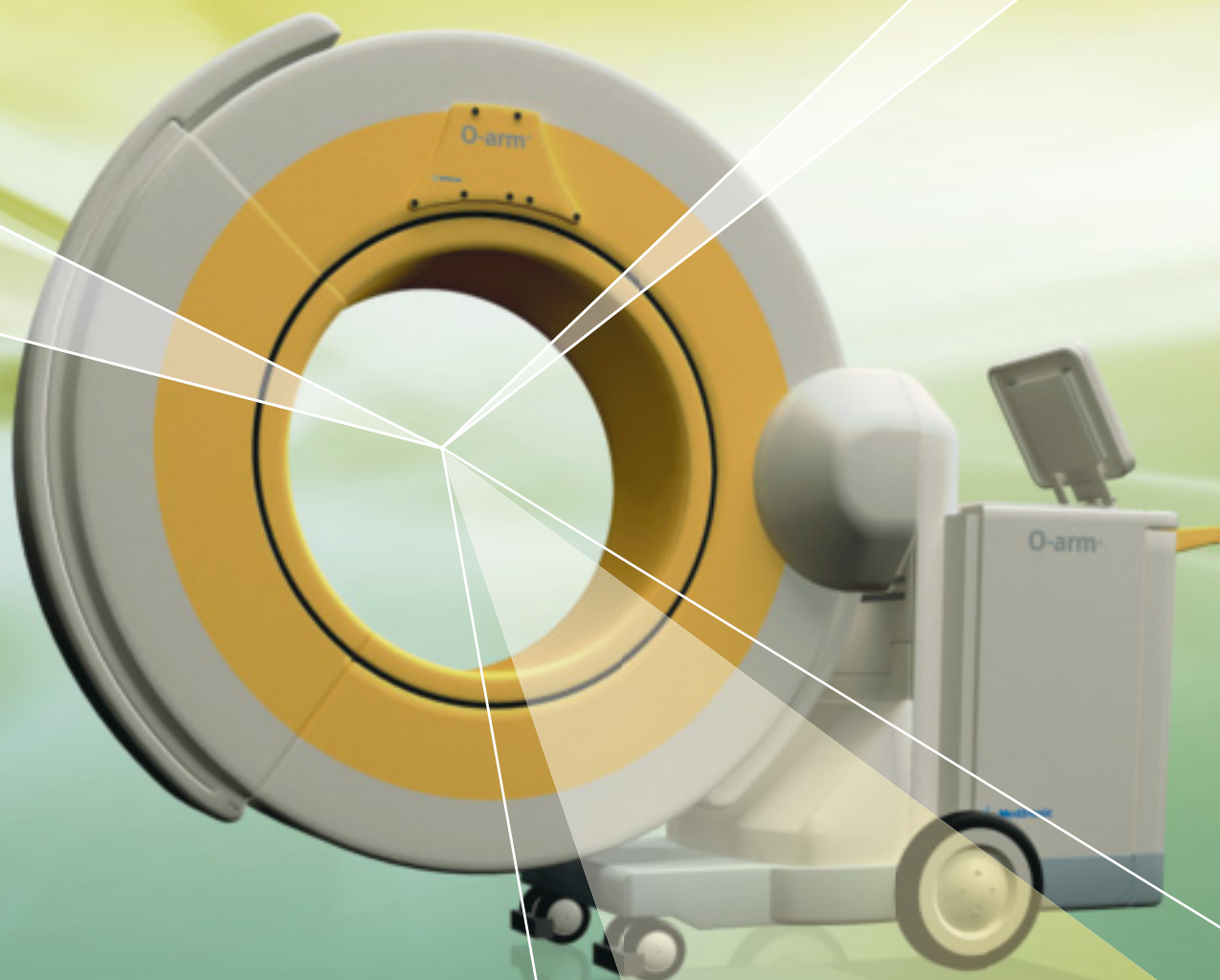




O-arm® Multi-dimensional Surgical Imaging System

The Information You Need, When You Need It Most





O-arm® System

Complete Multi-dimensional Surgical Imaging

In the modern OR, intra-operative imaging is a vital tool for the surgical team striving for the best patient outcomes. The O-arm® Intra-operative Imaging System can be used before, during and after surgery and brings intra-operative imaging to a new level:

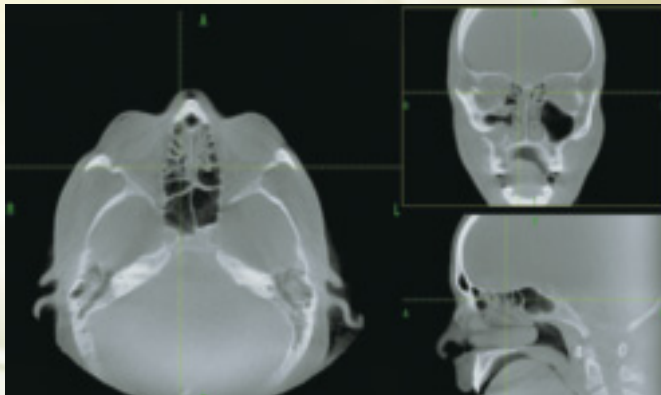
- Delivering simple and fast access to real-time, multi-plane 3D images (as well as 2D images) when the surgeons need them most, for full support of the unique workflow of spinal procedures
- Improved safety for the surgeon and staff
- Confidence in the achievement of surgical goals and hardware therapy placement, potentially eliminating revision surgeries
- Improved visualization allows surgeons to complete complex and minimally invasive procedures with ease

The unique combination of the O-arm® Intra-operative Imaging System with StealthStation® Navigation offers a one company solution for all your spinal procedural needs. From initial image through hardware therapy placement to pre-closure scan, Medtronic is your OR partner of choice..

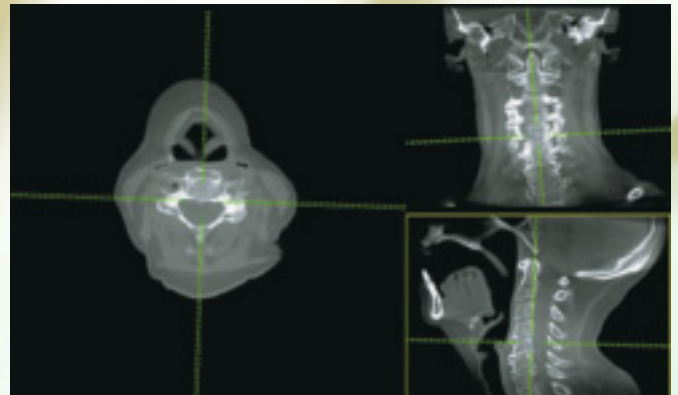
Better Insights to Your Patients

Large field-of-view and great image quality allow the surgeon to quickly obtain crucial visibility to any part of the patient's skeletal anatomy. This essential information is used to optimally treat spine, orthopedic and pelvic trauma cases with the ability to choose 2D or 3D imaging during surgery.

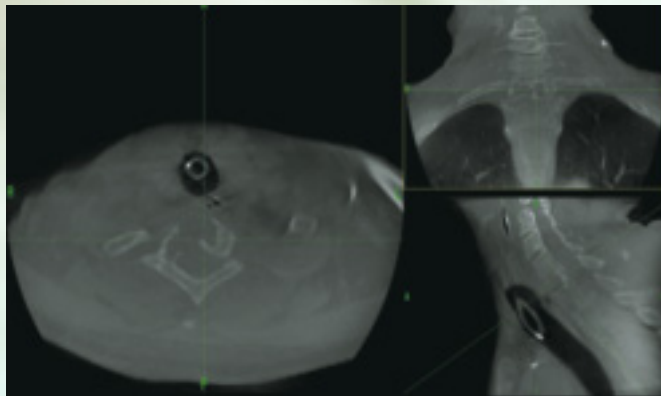




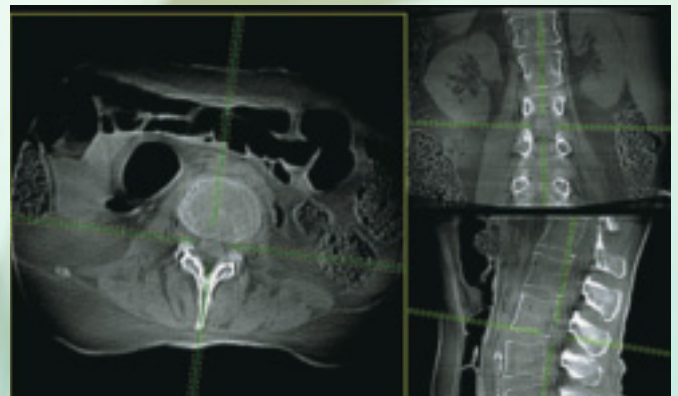
Maxillo-facial



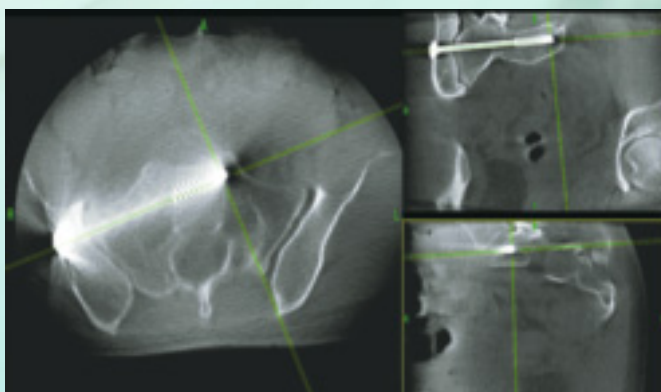
Cervical Spine



Cervical Thoracic Junction



Lumbar Spine



Pelvic Trauma



Foot

The O-arm® System – Designed for the OR

Image quality, patient safety, sterility and ease of use in the OR were essential design criteria in developing the O-arm® System. The system optimally supports the surgical workflow and creates a controlled surgical environment by minimizing manipulations needed during the procedure.



Full Mobility

Motorization for easy positioning in the OR.

Lateral Patient Access

Patented “breakable” gantry opens to allow lateral patient access.



Easy Draping

Multiple draping options exist, including several custom drapes for easy and fast draping. The O-arm® System Tube Drape is shown here.



Uncompromised Sterility

The closed gantry is designed to stay sterile during the whole procedure, eliminating parts moving in and out of the sterile field.

Flat Panel Detector Insights



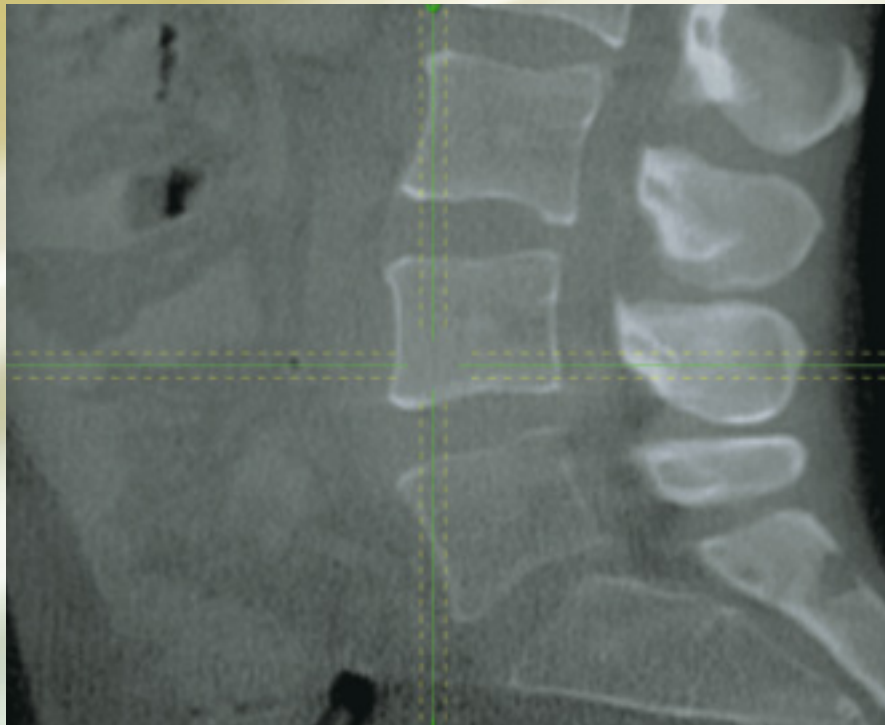
The impressive image quality of the O-arm® System is based on the use of distortion free flat panel technology. The state-of-the-art 30cm x 40cm flat panel detector with 3 Mega-pixels (1.5k x 2k) guarantees exceptional resolution and a high dynamic range for greater accuracy.

The O-arm® System combines a flat panel detector with a powerful 32kW generator to enable imaging of heavier patients and hard-to-image anatomy, such as the cervical-thoracic junction.

A full 360° 3D scan can be performed in just a few seconds, thanks to the closed gantry of the O-arm® System that eliminates the risk of collision with the patient or OR equipment. This reduces the artifacts caused by the patient's breathing and allows an almost uninterrupted surgical workflow.

Excellence in 2 and 3 Dimensions

Surgeons have the flexibility to choose between a full 3D scan and a simple, low-radiation 2D fluoroscopic image, depending on the information needed.



Sacrum and lower lumbar spine in the 3D volume of 20cm in diameter and 15cm in axial height



Lumbar spine lateral and AP images using the full-field-of view in 2D

3D Reconstructions

The scanned volume is 3 times larger than that obtained from any standard 3D C-arm. The O-arm® System scan can capture the entire cervical spine. The large image volume reduces the need for recentering of the image and allows the surgeon to comfortably handle cases where large areas need to be visualized.

In the 3D mode, the O-arm® System offers two levels of image acquisition using a 512 x 512 x 192 reconstruction Matrix:

Standard Definition 3D Imaging Mode:

Exposure time ~ 13 sec, 391 images over 360°

High Definition 3D (HD3D) Imaging Mode:

Exposure time ~ 26 sec, 750 images over 360°, with better contrast resolution and spatial resolution.

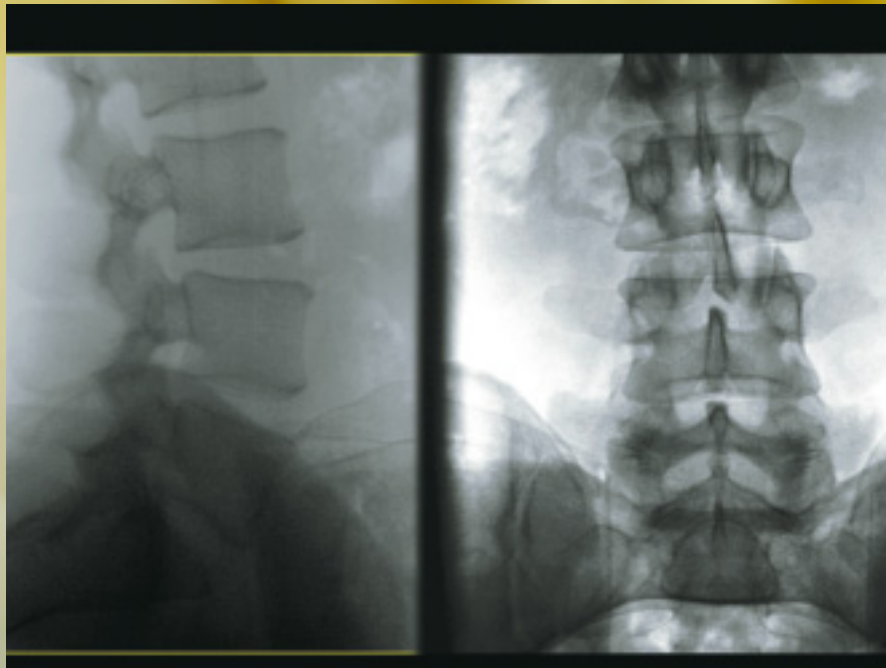
2D Fluoroscopic Pictures

The detector acquires images 3 times bigger than a 9" standard C-arm, simplifying the treatment of larger fractures.

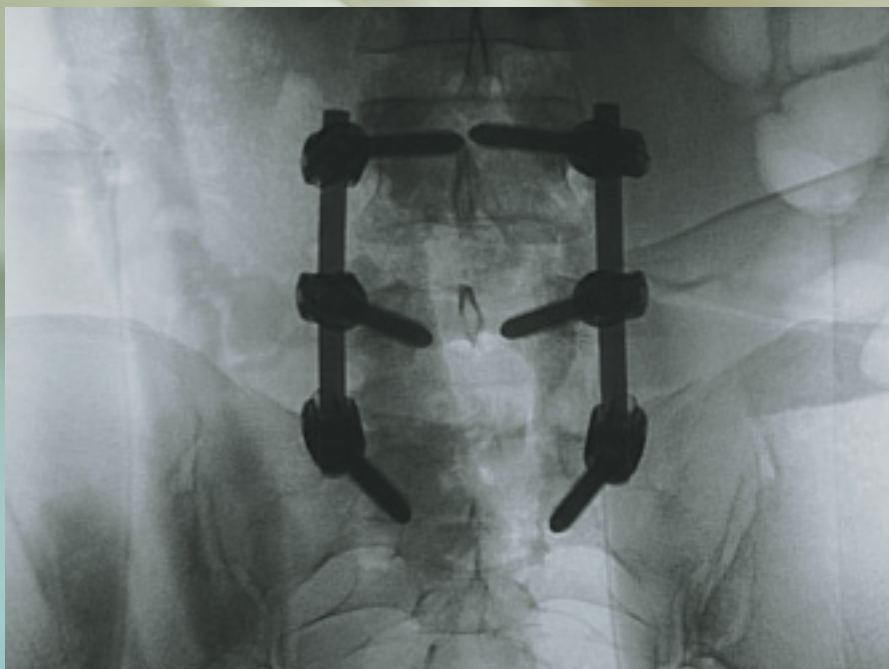
2D Fluoroscopic Imaging at its Best



Anterior Cervical Fusion Lateral



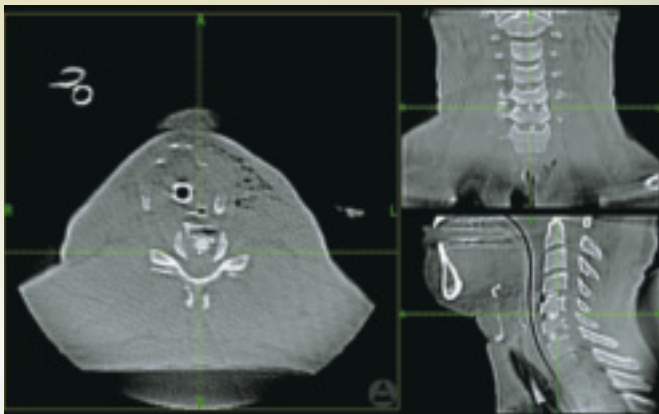
Lumbar Spine, Lateral and AP



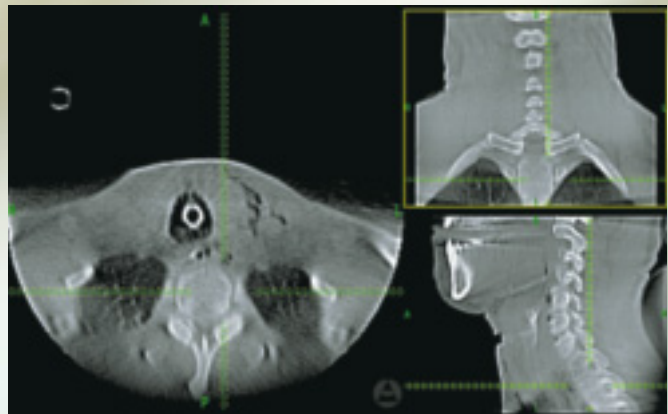
Sacro-Lumbar Stabilization AP

The 3rd Dimension in the OR

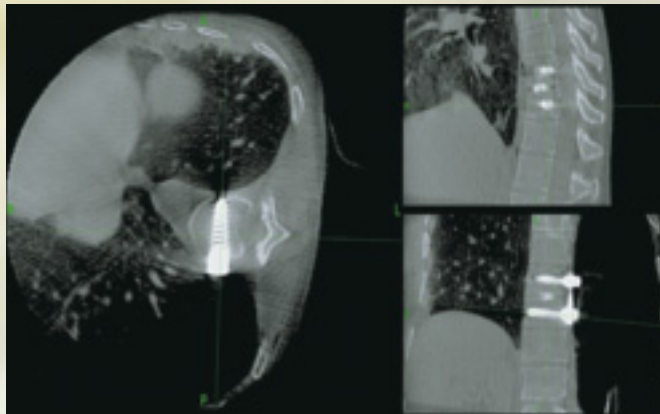
The system obtains the 3D image scan while the patient is in the operative position. It can be utilized to quickly get 3D information on the changing anatomy of the patient during surgery and to confirm placement of implants before closing the patient. This extra, on-demand information provides the surgeon with an additional tool that can result in enhanced patient outcomes.



Cervical Spine



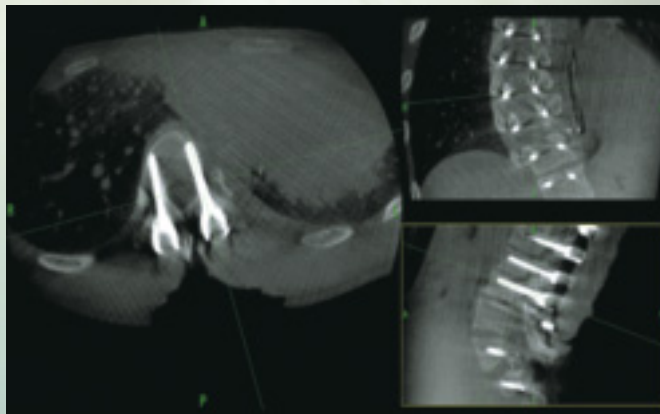
Cervical Fusion



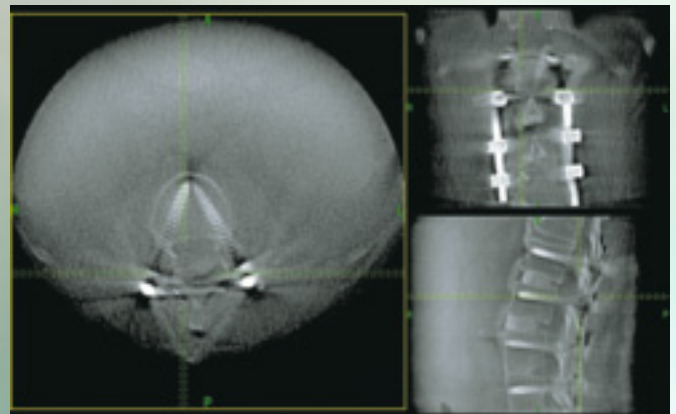
Thoracic Lateral Stabilization



Lumbar Spine



Thoracic Deformity



Lumbar Multilevel Stabilization

Superior Viewing, Easy Controls

Image Display

Images are displayed on the large, 30" digital flat screen of the O-arm® System Mobile View Station (MVS), providing the surgeon with excellent visibility from the operative field.

Viewing options include:

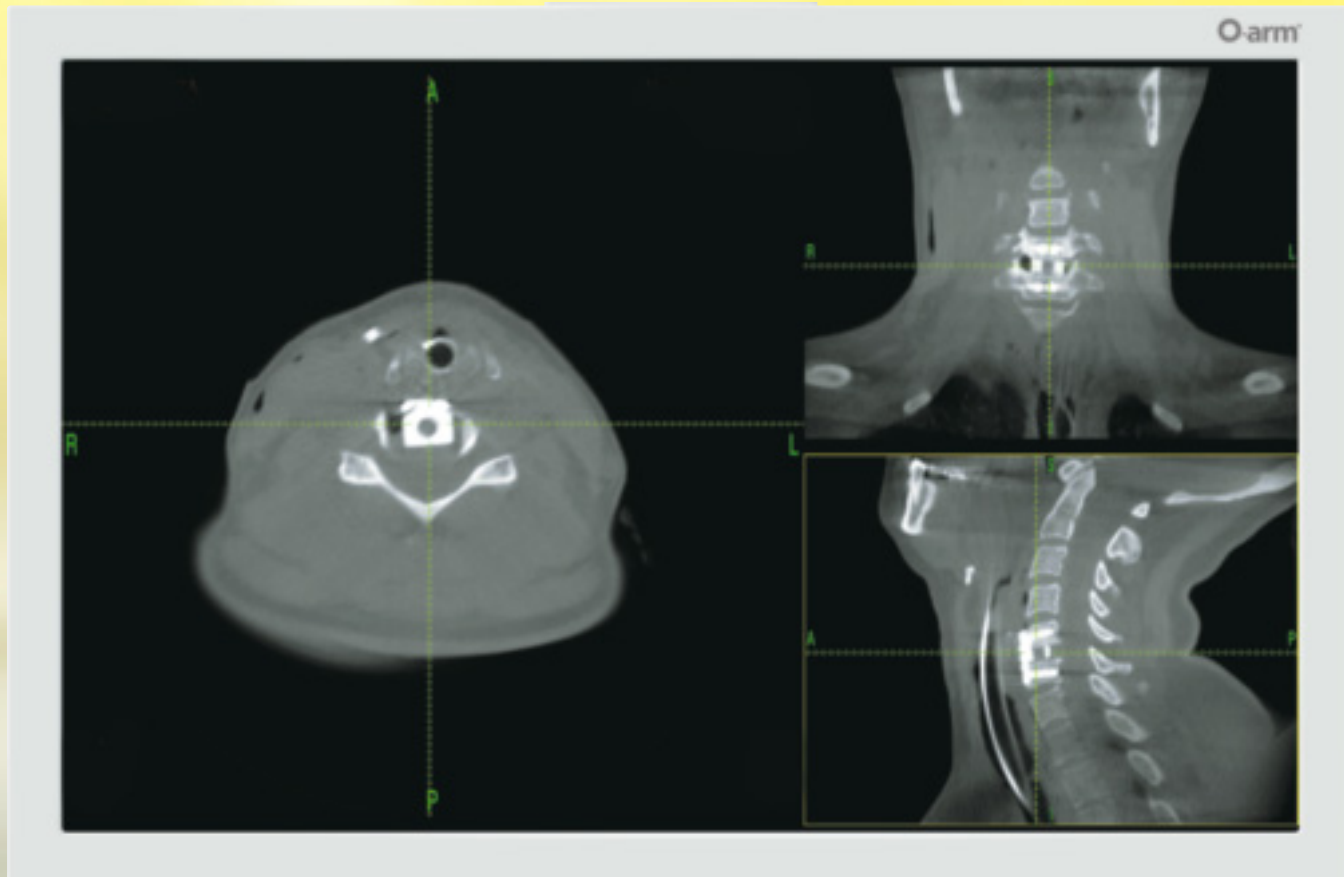
- 3D orthogonal and oblique views
- 2D views,
- MIP (Maximum Intensity Projection)
- Surface rendering
- Digital light box views

Network Interface

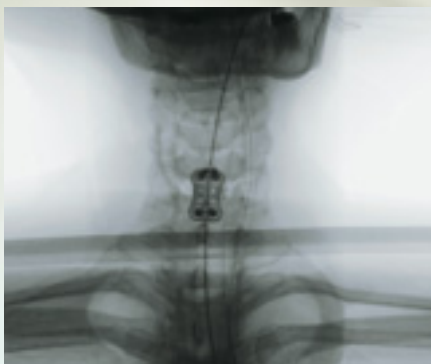
The O-arm® System is fully DICOM 3 compatible for simple transfer of O-arm® System data to the hospital network. Alternatively, a USB stick or a CD / DVD ROM can be used.

Total view control from the surgical field with the wireless, sterile, surgeon mouse.

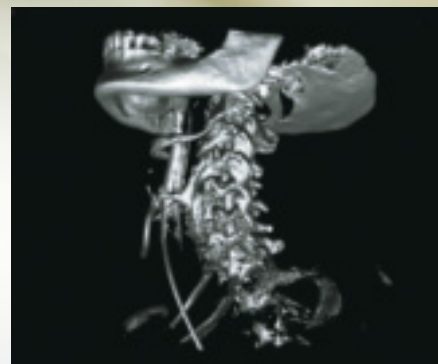




2D View



Surface
Rendering



MIP View



Lightbox View



Easy Beam Positioning

Move the beam at the touch of the button. All motions of the O-arm® System gantry and source-detector-unit are motor controlled. There is no need to push and pull levers and wheels like on a conventional C-arm. The central control panel allows the operator to reach imaging positions with precision and ease.



Iso-Wag™ Movement
+/- 12 Degrees



Tilt Movement
+/- 45 Degrees



Left-Right Movement
+/- 7 inches (17.8 cm)



Up-Down Movement
18 inches (45.7 cm)

Simple Controls

Ease of use starts at the control panel. A simple, intuitive central panel allows control of all motions and X-ray settings of the O-arm® System at the touch of a button. An identical second control panel can be draped and used within the sterile field to give the surgeon full control.



Smart Position Memory

The O-arm® System remembers your best views. The programmable memory stores the exact position of gantry and detector as well as any X-ray technique, in up to four imaging positions. The user can recall the exact image position at the touch of a button any time during surgery, eliminating time-consuming repositioning and additional X-ray exposure for scouting.

When not needed for imaging, the gantry moves to the user-defined park position within seconds, allowing surgeon access while remaining in the surgical field.



Imaging Position



Park Position

55* Seconds to Navigation

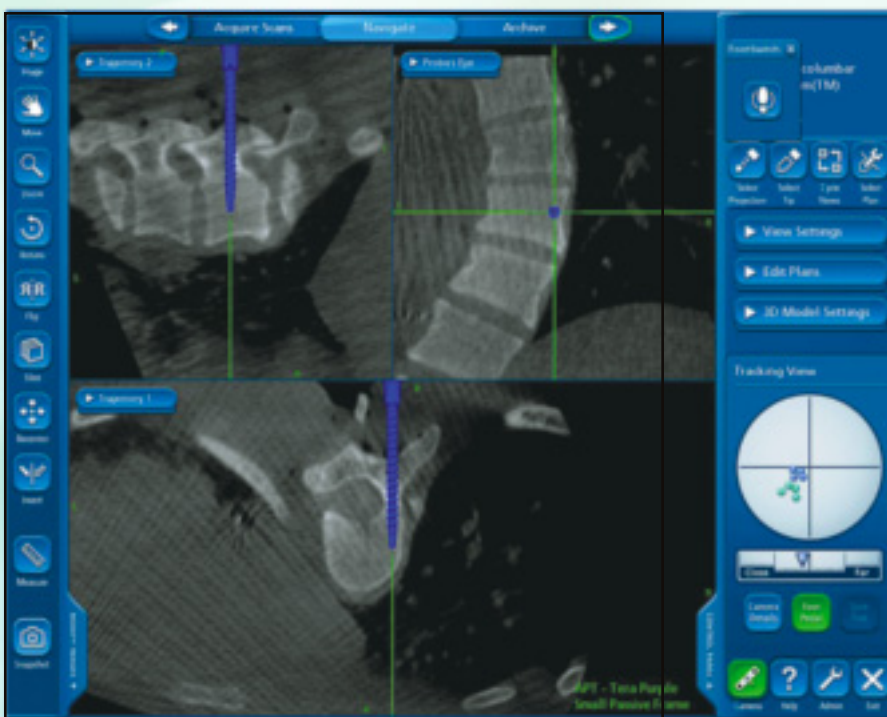
StealthStation® Surgical Navigation provides the surgeon with information about the patient's anatomy while reducing the X-ray exposure to patient, surgeon and staff.

The O-arm® System seamlessly interfaces with StealthStation® Navigation Systems. This solution provides **automatic data transfer** of the patient's 3D data set, as well as of the AP and lateral images. **Automatic patient registration** on the StealthStation® Navigation System eliminates the need for lengthy patient registration and allows the surgeon to navigate within seconds after image acquisition.

Additional 3D data sets can be acquired whenever needed during surgery, making navigation very easy to use.

The StealthStation® Navigation User Interface is streamlined to fit the workflow in the OR and to support the surgeon's work.

As the worldwide leader in surgical navigation, Medtronic offers a wide range of solutions in surgical navigation for Spinal, Neuro, Orthopedic, and ENT surgery.



55* Seconds

Image data automatically
transferred to StealthStation®
Navigation System
READY TO NAVIGATE

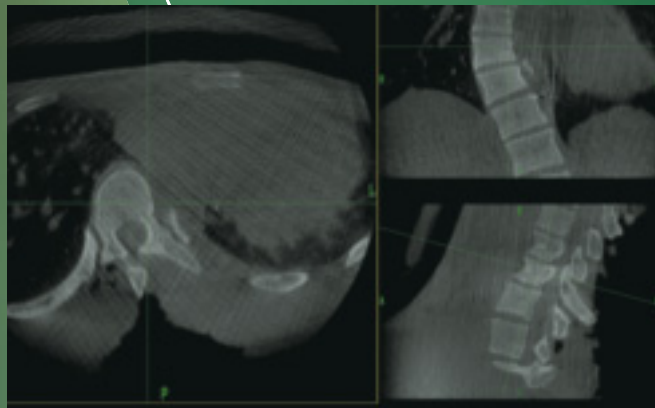
13* Seconds

For O-arm® System
3D image acquisition

30* Seconds

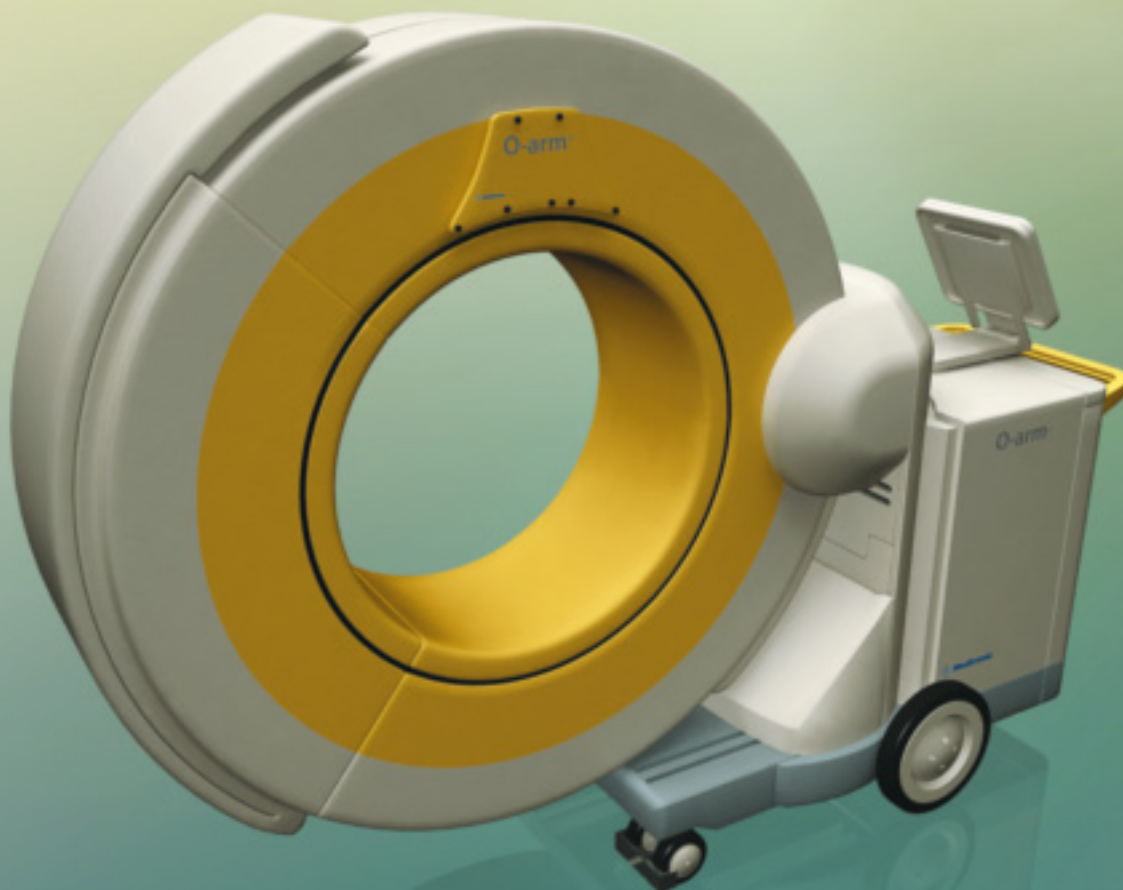
3D reconstruction displayed
on the O-arm® System Mobile
View Station

*As measured in standard
definition mode using O-arm®
System software release 3.0.3
and StealthStation® Treon® with
Spine Software release 1.4. Your
times might vary.



The O-arm® System - Radiation Exposure

The O-arm® Imaging System utilizes ionizing radiation (x-rays) for diagnostic imaging. The risks associated with diagnostic x-ray arise from excessive exposure to ionizing radiation (x-rays). The O-arm® meets all applicable safety standards, and the labeling provides the necessary information for safe operation. Please contact your Medtronic Sales Representative for further information regarding the radiation performance of the O-arm® Imaging System.



The O-arm® System – Changing Surgery

Controlled Outcome and Simplified Workflow

The O-arm® System enables the surgeon to evaluate the outcome of the surgery in 3D before closing the patient.

Its use may reduce the need for additional CT imaging before, during, and after surgery. This greatly simplifies the workflow by reducing the number of trips to the CT and freeing up the CT for other patients.

Enabler for Advanced Surgery

Decisions in the OR are made in an instant and based on the information available. The advanced 2D and 3D O-arm® System images support surgeons in critical cases where previously little or no imaging information was available. For procedures in the thoracic spine, for the treatment of complex deformities or fractures, and for minimally invasive surgery, the O-arm® System, combined with StealthStation® Navigation, provides the surgeon with an additional tool to treat these complex cases.

Easy Navigation

With the automated interface between the StealthStation® Navigation System and the O-arm® System, setup for navigation is minimized, making it the tool of choice in the OR.

Controlled Environment

Set up the best imaging positions at the beginning of the surgery and the O-arm® System will recall your position any time during the surgery at the touch of a button, reducing manual repositioning and the risk of errors, letting you concentrate on the patient in a controlled and sterile environment.

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