EOS - low dose 2D|3D imaging system

EOS is an imaging device which combines the use of a Nobel Prize-winning particle detector and an innovative linear scanning technique. With these two technologies, EOS enables whole body frontal and lateral images to be acquired simultaneously for a standing or seated patient, with a reduction in the dose of 50% compared to a DR system[1] and up to 85% compared to a CR system[2], with equal or superior image quality.

In less than 20 seconds, two full-body digital radiographs are taken, without image stitching or any cassette to handle: EOS is a real time-saver for patients and operators.

- **Significant exposure dose reduction[1,2] compared to Computed Radiography or Digital Radiography**
- **Micro Dose option, for follow-up measurements in pediatrics, with dose equivalent to a week's natural radiation exposure[3]**
- **Exceptional image quality**
- **Simultaneous acquisition of frontal and lateral images**
- **Continuous image (no "stitching") and true size (no magnification)**
- **Acquisition of full body or localized images of a seated or standing patient**
- **Total exam cycle time of around 4 minutes for a complete frontal and lateral spine examination[1]**

Specifications

2D imaging

- Images are obtained by vertical scanning
- Patient is in a standing or seated position
- Two simultaneous frontal and lateral acquisitions. Single plane acquisitions are also possible.
- The user-defined acquisition zone may cover the full body or a specific zone (spine, lower limbs, etc.) up to 44.8 cm wide and 175 cm high
- Image file size: between 2 MB and 70 MB depending on the acquisition area
- Acquisition is 5 to 10 seconds for a spine, less than 20 seconds for a whole body
- Automatic detector gain adjustment ensures maximum image contrast, regardless of kV being applied

Detectors

- 2 linear detectors, Nobel prize-winning AGD technology (Adjustable Gain Detector)
- Number of pixels/line: 1764/line, Pixel size: 254 µm
- Pixel depth: 16 bits (› 65 000 grey levels)
- Typical Dynamic Range: › 90dB

Tubes

- Two X-ray tubes, maximum power 42 kW
- Small or large focal spot (0.4 x 0.7mm / 0.6 x 1.3mm)
- Aluminum (1 mm) or Copper (0.1 mm) filtration

Acquisition software

- Patient information management compatible with DICOM 3.0 standard (Modality Worklist SCU)
- Selection of area of interest (height and width) and acquisition mode (biplane, frontal or lateral)
- Selection of morphotype and anatomical region
- Adjustment of kV, mA and acquisition speed (auto/manual)
- Display of radiation exposure dose (mGy.cm²)
- Image display and processing tools (windowing, zoom, measurements, secondary captures, annotations)
- Contrast enhancement (smooth, standard, strong) and specific processing if there is a prosthesis present, available at acquisition or during post-processing. The types of default processing and contrast enhancement are set up during applications training
- Image print SCU and print true size
- Archive on DICOM 3.0 PACS (Verification service and Image Storage SCU & SCP, Query Retrieve SCU, storage commitment SCU)
- Statistical tool for analyzing the number of rejected or repeated images (RRA)
- Automatic generation and sending of reports on the dose accumulated during the examination:
  - » RDSR (Radiation Dose Structured Report)
  - » MPPS (Modality Performed Procedure Step)

Dimensions

- External dimensions: 2 m (l) x 2 m (w) x 2.7 m (h)
  6.6 ft (l) x 6.6 ft (w) x 8.9 ft (h)
- Internal dimensions: 76 cm (l) x 76 cm (w) x 254 cm (h)/
  29.9 in (l) x 29.9 in (w) x 100 in (h)
- Width of patient access: 46 cm / 18.1 in

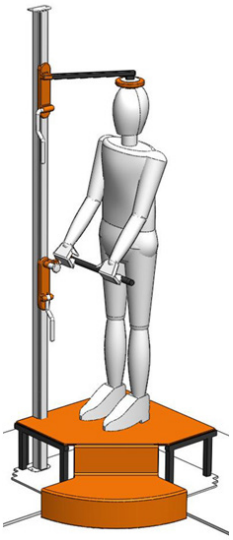
Accessories delivered with EOS system

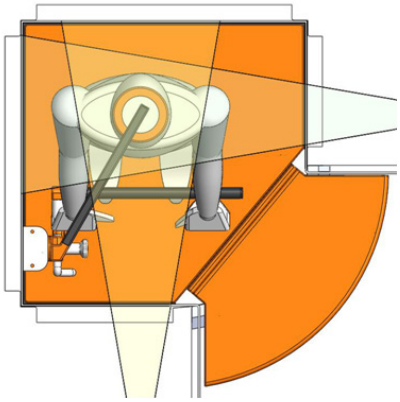
Platform with footstep

- Removable platform including fixation support, a platform and a footstep
- Patient raised by: 30 cm / 11.8 in

Patient stabilization

- Stabilization bar: enables the stabilization of the patient for acquisitions of the lower limbs in AP
- Posture stabilization device: enables the stabilization of the patient using a pressure pad applied to the head for AP and PA examinations of the spine and the full body





Quality control accessories

- Equipment used for the Quality Control procedure provided by EOS imaging in accordance with the regulations in force

Microphone

- Microphone and loudspeaker to communicate with the patient in the cabin

Options

Micro Dose

- Indicated for pediatrics imaging with patient entrance dose of 10 to 90 µGy
- For the purpose of follow-up patient measurements in pediatrics (lower limb deformities, scoliosis angle trending...)
- Available for 3 anatomical regions: full spine, lower limbs, full body

Laser positioning system

- A laser positioning system[4] is available as an option on customer request in order to expedite the definition of top and bottom limits of the scanning area by using two independent laser lines projected on a patient's skin
- This option comes in addition to the external metric scale and preview scan setting tools offered in the EOS system for the definition of the scanning area

EC conformity assessment: LNE/G-MED CE0459, Class IIb . For USA - Caution : Federal law restricts this device to sale by or on the order of a physician

[1] Comparison of radiation dose, workflow, patient comfort and financial break-even of standard digital radiography and a novel biplanar low-dose X-ray system for upright full-length lower limb and whole spine radiography. Dietrich TJ et al. Skeletal Radiol. 2013.

[2] Diagnostic imaging of spinal deformities: reducing patients radiation dose with a new slot-scanning X-ray imager. Deschenes S et al. Spine (Phila Pa 1976)2010 Apr 20;35(9):989-94.

[3] EOS microdose protocol for the radiological follow-up of adolescent idiopathic scoliosis. Ilharreborde B. et al. Eur Spine J. 2015 Apr 24.

[4] 

EOS imaging SA.
10 rue Mercoeur | 75011 Paris France | +33 (0) 155 25 60 60

EOS imaging Inc.
185 Alewife Brook Parkway #410 | Cambridge, MA 02138 USA | +1 (678) 564 5400

www.eos-imaging.com