EOS X-RAY IMAGING SYSTEM: ONE OF THE LATEST TECHNOLOGY ADVANCEMENTS AVAILABLE IN THE REPUBLIC OF MOLDOVA

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Background: The EOS X-ray imaging system is a low-dose, 3D imaging system manufactured by EOS imaging (formerly known as Biospace Med, Paris, France). The imaging system relies on the high sensitivity of a special detector (a multi-wire chamber invented by Georges Charpak, for which he was awarded the 1992 Nobel Prize) to produce high-quality images with less irradiation than standard imaging techniques. Thus, EOS delivers a radiation dose that is 6 to 9 times less than a standard X-ray film and 20 times less than a basic computed tomography scan. The technique allows capturing simultaneous frontal and lateral head-to-toe images of patients in the upright, weight-bearing position with an outstanding image quality. True to size images (1:1 scale) for surgical planning and monitoring of bone and joint diseases can be also obtained.

Common indications: While EOS imaging may have many potential applications, it has been reported as being most useful in relation to those conditions that require imaging that is weight-bearing, full body, simultaneous postero-anterior and lateral, three-dimensional (3D), and/or where radiation exposure is a concern [1,2]. Common indications include kyphosis, scoliosis, deforming dorsopathies and congenital deformities of the spine, hips or lower extremities. Reducing radiation dose may be particularly beneficial for children who need to be imaged frequently, such as children with spinal deformities.

Although EOS imaging is considered by many users to be the future gold standard of X-ray imaging of the skeleton due to its many advantages (mainly 3D reconstruction with a low radiation dose), it should be remembered that the modality is not currently used for assessing injuries or conditions that can be evaluated with general radiography, such as bone fractures, evaluation of lung nodules or examinations involving fluoroscopy, angiography, and mammography. Traditional X-rays are still the standard of care in such situations.

Potential impact on healthcare services: In the Republic of Moldova an EOS X-ray imaging system is already available at the Medpark International Hospital. Its impact on the quality of radiology and medical imaging services is still under evaluation and this may become more evident in the coming years. Numerous improvements to the EOS X-ray imaging system are also under development, as the modality is rapidly gaining popularity in both clinical and research settings.

[1] McKenna C, Wade R, Faria R, Yang H, Stirk L, Gummerson N, Sculpher M, Woolacott N. EOS 2D/3D X-ray imaging system: a systematic review and economic evaluation. *Health Technol Assess*. 2012;16(14):1-188
[2] Melhem E, Assi A, El Rachkidi R, Ghanem I. EOS(®) biplanar X-ray imaging: concept, developments, benefits, and limitations. *J Child Orthop.* 2016 Feb;10(1):1-14.