Clinics in Oncology

Letter to the Editor
Published: 14 Sep, 2017

Who is Supporting the Selection of X-Ray Machines in Orthopedic Surgery?

*Bria Moore and Terry Yoshizumi**

Department of Surgery, Duke University Medical Center, USA

Letter to the Editor

As the American obesity rate rises, spinal complications requiring surgical intervention are also on the rise [1,2]. A common procedure involves the fusing of three to five lumbar vertebral bodies, known as a two or three level lumbar fusion. Lumbar fusion surgery typically requires intraoperative imaging to accurately assess spinal locations. With renewed demand, imaging technology has broadened to include a variety of different types such as serial radiography, C-arm fluoroscopy, and 3-dimensional imaging. These advanced machines are typically marketed directly to orthopedic surgeons. In doing so, imaging protocols are rarely optimized for specific use cases such as spinal surgery and often provided directly from the manufacturer. However, most imaging devices are calibrated to provide diagnostic quality images. Orthopedic surgery applications require bone-soft tissue contrast which is easily achievable, even in lower quality images. Since the surgical technique requires multiple images, cumulative doses per procedure can be quite high especially in institutions using large Multi-Detector CT (MDCT) machines in the Operating Room (OR). We found that amongst the every-growing variety of imaging machine types such as: MDCT scanners, mobile CT scanners, C-arm machine and fluoroscopy machines, the dose per procedure can be highly varied. Patient outcome is usually unaffected by machine type. If physicians are choosing machines based on personal preference, the variation in patient dose is concerning. Medical physicists are not often consulted in purchasing decisions for use in OR suites; instead, decisions are made between vendors and orthopedic surgeons without any physics consultation. Though many radiology departments maintain medical physics support, the service usually does not extend beyond the department to other specialties such as orthopedic surgery. Further, support for educating for surgeons on the risks involved when adopting new technology and the need for consultation on the selection of imaging equipment is lacking. We recommend the following approach be implemented for patient safety and dose management in orthopedic practice: medical physics along with clinical engineering should be consulted in the initial selection of imaging equipment and succeeding actions including acceptance testing before clinical use, regularly-scheduled quality assurance, radiation dose monitoring for patient and users, and finally to providing education on radiation physics and radiation risks. The above general approach may equally be adopted to other x-ray imaging services such as cardiology and sports medicine where x-ray imaging equipment is used and updated routinely.

References

1. Shiri R, Karppinen J, Leino-Arjas P, Solovieva S, Viikari-Juntura E. The association between obesity and low back pain: a meta-analysis. Am J Epidemiol. 2010; 171(2): 135-154.

2. Liuke M, Solovieva S, Lamminen A, Luoma K, Leino-Arjas P, Luukkonen R, et al. Disc degeneration of the lumbar spine in relation to overweight. Int J Obes (Lond). 2005; 29(8): 903-908.

OPEN ACCESS

Correspondence:
Terry Yoshizumi, Department of Surgery, Duke University Medical Center, USA,
E-mail: terry.yoshizumi@duke.edu

Received Date: *23 Jun 2017*
Accepted Date: *20 Aug 2017*
Published Date: *14 Sep 2017*

Citation:
Moore B, Yoshizumi T. Who is Supporting the Selection of X-Ray Machines in Orthopedic Surgery?. Clin Oncol. 2017; 2: 1347.