

< Back to results | 1 of 2 Next >

Export Download Print E-mail Save to PDF Add to List More... >

[View at Publisher](#)

Iranian Journal of Medical Physics [Open Access](#)  
Volume 16, Issue 2, 1 March 2019, Pages 166-170

## Image quality and entrance surface dose evaluation of lateral cervical spine: A study using grid and non-grid techniques (Article)

Moey, S.F. Ramlee, N.N.B.M.

Department of Diagnostic Imaging and Radiotherapy, Kulliyah of Allied Health Sciences, International Islamic University Malaysia, Pahang, Malaysia

### Abstract

[View references \(17\)](#)

**Introduction:** The purpose of this study is to investigate the effects of grid and non-grid techniques in the lateral cervical spine radiography on image quality and entrance surface dose (ESD). Although image quality and radiation doses have been studied by researchers, there is still a dearth of information on image quality and patient dose with different techniques. **Material and Methods:** The radiographs of the lateral cervical spine were acquired by positioning the RANDO phantom abutting the erect bucky while using the grid and non-grid techniques. This study benefited from using a 24 cm x 30 cm Fuji standard cassette type imaging plate. A Leeds TOR test tool was utilized for relative comparison of image quality. The ESD of each examination was determined by using the optically stimulated luminescence dosimeter. **Results:** The increased kilovoltage (kVp) resulted in the reduction of ESD whether moving grid, stationary grid, or non-grid techniques were utilized. Significant differences in terms of contrast sensitivity and spatial resolution were indicated when comparing the grid technique to that of the non-grid technique (i.e.,  $\chi^2=8$  and 5, respectively  $p < 0.05$ ). The results also indicated significant differences in ESD when using the moving grid, stationary grid, and non-grid techniques (i.e.,  $\chi^2=7.2$ ,  $p < 0.05$ ). **Conclusion:** Significant differences in image quality and ESD were indicated when grid and non-grid techniques were used in the lateral cervical spine radiography. A non-grid with the highest appropriate kVp is recommended as the air gap acts as a grid, resulting in acceptable image quality with reduction in ESD. © 2019 Mashhad University of Medical Sciences.

### Author keywords

[Cervical vertebrae](#) [Digital radiography](#) [Image quality](#) [Radiation dosage](#)

ISSN: 1735160X

Source Type: Journal

Original language: English

DOI: 10.22038/ijmp.2018.33059.1400

Document Type: Article

Publisher: Mashhad University of Medical Sciences

### References (17)

[View in search results format >](#)

All [Export](#) Print E-mail [Save to PDF](#) [Create bibliography](#)

1 Berges, M., Perry, M.J.

#### Improved lateral cervical spine techniques

(2014) *Radiologic Technology*, 85 (4), pp. 447-451.

<http://www.radiologicstechnology.org/content/85/4/447.full.pdf>

### Metrics

0 Citations in Scopus

0 Field-Weighted  
Citation Impact



### PlumX Metrics

Usage, Captures, Mentions,  
Social Media and Citations  
beyond Scopus.

### Cited by 0 documents

Inform me when this document  
is cited in Scopus:

[Set citation alert >](#)

[Set citation feed >](#)

### Related documents

Excessive collimation

Sandridge, T.G.  
(2013) *Radiologic Technology*

Radiologic safety: Historical  
perspectives and contemporary  
recommendations

Barr, J.M.B. , Schiska, A.D.  
(2005) *Journal of Radiology  
Nursing*

Dose optimization in pelvic  
radiography by air gap method  
on CR and DR systems - A  
phantom study

Chan, C.T.P. , Fung, K.K.L.  
(2015) *Radiography*

[View all related documents based  
on references](#)

[Find more related documents in  
Scopus based on:](#)

[Authors >](#) [Keywords >](#)

- 2 Simpson, A.K., Whang, P.G., Jonisch, A., Haims, A., Grauer, J.N.  
The radiation exposure associated with cervical and lumbar spine radiographs  
(2008) *Journal of Spinal Disorders and Techniques*, 21 (6), pp. 409-412. Cited 35 times.  
doi: 10.1097/BSD.0b013e3181568656  
  
View at Publisher
- 
- 3 Shrestha, S., Maharhan, S., Khanal, U., Humagain, M.  
Evaluation of image quality in cervical spine lateral radiographs  
(2016) *Journal of Chitwan Medical College*, 6 (15), pp. 30-33.
- 
- 4 Carlton, R.R., Adler, A.M.  
(2006) *Principles of radiographic imaging: An art and a science*. Cited 85 times.  
New York: Delmar
- 
- 5 Bontrager, K.L., Lampignano, J.P.  
(2014) *Textbook of radiographic positioning and related anatomy*. Cited 119 times.  
Elsevier, St Louis-Missouri
- 
- 6 Callaway, W.J.  
(2016) *Mosby's Comprehensive Review of Radiography: The Complete Study Guide and Career Planner*. Cited 2 times.  
Elsevier, St Louis-Missouri
- 
- 7 Bell, N., Erskine, M., Warren-Forward, H.  
Lateral cervical spine examinations: An evaluation of dose for grid and non-grid techniques  
(2003) *Radiography*, 9 (1), pp. 43-52. Cited 6 times.  
<http://www.elsevier.com.ezproxy.um.edu.my/inca/publications/store/6/2/3/0/6/8/index.htm>  
doi: 10.1016/S1078-8174(02)00078-0  
  
View at Publisher
- 
- 8 Wang, J., Xu, J., Baladandayuthapani, V.  
Contrast sensitivity of digital imaging display systems: Contrast threshold dependency on object type and implications for monitor quality assurance and quality control in PACS  
(2009) *Medical Physics*, 36 (8), pp. 3682-3692. Cited 11 times.  
[http://aapm.onlinelibrary.wiley.com.ezproxy.um.edu.my/hub/journal/10.1002/\(ISSN\)2473-4209/issues/](http://aapm.onlinelibrary.wiley.com.ezproxy.um.edu.my/hub/journal/10.1002/(ISSN)2473-4209/issues/)  
doi: 10.1118/1.3173816  
  
View at Publisher
- 
- 9 Field, D.T., Bell, L., Mount, S.W., Williams, C.M., Butler, L.T.  
Flavonoids and Visual Function: Observations and Hypotheses  
(2014) *Handbook of Nutrition, Diet and the Eye*, pp. 403-411. Cited 2 times.  
<http://www.sciencedirect.com.ezproxy.um.edu.my/science/book/9780124017177>  
ISBN: 978-012404606-1; 978-012401717-7  
doi: 10.1016/B978-0-12-401717-7.00041-1  
  
View at Publisher