Analysis of Radiological Request Forms for Radiological Examinations in Conjunction with Optimization of Exposure Parameters

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Abstract— *All radiological request forms (RRFs) should be adequately and legibly completed, when performing radiological examination exposure parameters (EPs) should be within the standard level to maintain patient care and high accuracy of diagnosis. This study was assigned as a descriptive cross sectional study in one of teaching hospital in Srilanka.450 RRFs and optimizations of EPs were assessed by careful observation while performing the radiological examinations within three months period of time. Data analysis revealed 360 out of the 450 RRFs were completed fully. It was 80%. Commonest unfilled fields were clinical history (4.89%) and patients' sex (4.44%) in RRFs. Properly set EPs were observed in 434 request forms out of 450 while performing examinations. It was 96.44%. Focal spot size (5.56%) and FFD (5.11%) were high percentage of improper used fields. The Study was revealed satisfactory completion of RRFs and optimization of EPs for radiological examination purposes, while 20% of RRFs were not filled completely. 9.77 out of 10 fields were filled adequately in RRF. 5.76 out of 6 fields were used properly when examining the patients.*

Keywords— Radiological request forms, Exposure parameters, Clinical history

I. INTRODUCTION

Radiological request forms (RRFs) are essential communication tools used by doctors to refer patients for radiological investigations. Importance of the radiological request form signed by a qualified medical officer should not be underestimated. Information of RRFs are essential in identification of the patient and prepares him/her for the proper investigations. Filling of the RRFs adequately cannot be overemphasized as it reduces the number of unhelpful radiographic examinations performed and aids concise radiological diagnosis. It also indirectly helps to reduce the investigation time, reduce unwanted dose and improve the quality of service offered to the patients.

Purpose of the study was evaluate adequacy of radiological request forms which were filled by doctors and access the performance of radiological technologist whether they meet international standard.

II. MATERIALS AND METHODS

The study was designed as a descriptive cross sectional study in the department of Radiology at the Teaching Hospital Gampola in SriLanka. Questionnaires were developed with perfect and care full access of previous research study collections which were performed in abroad. After request forms were assessed under the categories of well-trained observation, for the completeness of the fields. A field will be taken completed when the appropriate data was written in the field clearly. A blank or unclear field was given a 0 (zero) score while a completed clear data field was given a score of 1 (one). These fields were included in the questionnaire.

a) Radiological request form

Ten fields were assessed in each RRFs. They are Name, Age, Sex, Date, Ward, Clinic & OPD No, BHT No, Clinical History Region & Nature of examination, Referring Physician's Name and referring Physician's signature. It includes mainly two parts medically related details about patients and referring physicians and assessment of radiological exposure parameters.

b) Exposure parameters

Optimization of exposure parameters (EPs) were observed while radiological technologist performing the examinations. Well training and careful observation assured each and every steps of radiological technologist while performing the

examinations. 6 fields were assessed for optimization of EPs. They are exposure factors (kVp and mAs), Film focal distance (FFD), Collimation, Grid, Focal Spot Size, and number of views)

III. RESULTS

Our audit's data analysis revealed that only 360 out of the 450 forms reviewed were completed in full (Table 1). The parameters fulfilled in all the forms were the presence of Name of the patient and Region & Nature of examination. The Age of the patients was mentioned in 439 (97.56%) forms, and the sex of the patient was evident in 430 (95.56%) forms. 444 (98.67%) forms had dates of the request while 6 (1.33%) forms did not have date of request on it; Ward, Clinic & OPD No were written on 441(98%) forms only. BHT No was provided in 444(98.67%) forms. The clinical history field was filled in 428(95.11%) forms. The name of the medical officer was seen in 432 (96.00%).The referring medical officers' signature was seen in 441 (98%) request forms.

Table 1. Distribution of scores in terms of frequency and percentage for each field on the radiological request form

Field	Unfiled Fields		Filled Fields	
Name	0	0.00%	450	100.00%
Age	11	2.44%	439	97.56%
Sex	20	4.44%	430	95.56%
Date	6	1.33%	444	98.67%
Ward, Clinic & OPD No	9	2.00%	441	98.00%
BHT No	6	1.33%	444	98.67%
Clinical History	22	4.89%	428	95.11%
Region & Nature of examination	0	0.00%	450	100.00%
Referring Physician's Name	18	4.00%	432	96.00%
Referring Physician's Signature	9	2.00%	441	98.00%

Within 450 request forms properly set exposure parameters were observed in 434(96.44%) request forms (Table 2). Improper exposure parameters mean repeated and unhelpful radiologic final product of X-ray films. 96.89% of the evaluated request forms were with accurately set grid. 431(95.78%) were with properly set collimation while 19(4.22%) didn't comply it. 427(94.88%) out of the total request forms analyzed had adequately set FFD while the other 5.11% were inadequately set. 5.56% were not met with the required size of the focal spot while 94.44% were successfully full filled it.

Table 2-Distribution of scores of exposure parameters for each radiological request form

Exposure parameters	Rate of proper use		Rate of improper use	
Exposure Factors	434	96.44%	16	3.56%
FFD	427	94.88%	23	5.11%
Collimation	431	95.78%	19	4.22%
Grid	436	96.89%	14	3.11%
Focal Spot Size	425	94.44%	25	5.56%
Number of views	441	98.00%	9	2.00%

IV. DISCUSSION

The objective of the current study was to evaluate the adequacy of completion of plain radiological request forms and adjustments of exposure parameters accordingly. This study revealed a relatively low percentage 20% (90/450) of inadequately filled radiology request forms. About 80 %(360 out of 450) of request forms were completely filled.

Patient's bio data tends to serve as a guide to decide the appropriate radiological investigation and limit patient exposure to unnecessary radiation which may be harmful. Every request forms studied were completely filled for name of the patient and region of the examination. Age and sex were not mentioned in 2.44% and 4.44% of radiology request forms respectively, meanwhile ward number and BHT number were missed in 2.00% and 1.33% of request forms respectively. Ward number and the clinic where the patient is coming from is also serving as a guide to differential diagnosis and appropriate radiological exposure or treatment.

In addition to pertinent patient identifiers and the examination to be conducted, the radiology request must contain clinical information to justify conducting a radiologic examination. This allows the radiologist to make a more accurate and specific diagnosis. 95.11% of request forms

were observed with completely filled section of clinical history, while 4.89% was responsible for unfilled clinical history.

Referring physician's name and signature were missing in 4% and 2% request forms respectively. In this point physicians name should be there & signed clearly. This is vital if there is an unexpected medical emergency so the radiologist can be contacted immediately.

Accurate adjustment of the exposure parameters depend on the details furnished by the request forms. According to the requested region for examination, FFD, focal spot size and grid have to be changed.94.88% (427), 94.44% (425), 96.89 % (436) of the analyzed forms were subjected to change for FFD, focal spot size and grid respectively. In that station there were no proper ways to measure the distance. In emergency cases and the patient was hard to position FFD may not adjusted accurately. Number of views requested in the request form is to be similar to the real number of views obtained; this was in 98% of the cases studied while other 2% were failed.

V. CONCLUSION

This study revealed 20% of inadequately filled radiology request forms were observed. About 80% of request forms were completely filled. . 9.77 out of 10 fields were filled adequately in RRFs. 5.76 out of 6 fields were used properly when examining the patients and adjusting exposure parameters. Unfilled and improper fields should corrected by radiology department.

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