

# “ARE THE CT SCAN REQUEST FORMS ADEQUATELY FILLED?”

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## ABSTRACT

**BACKGROUND:** Complete filling of the radiology request form is of paramount importance in helping the radiologist give concise radiological diagnoses and avoid unhelpful radiological examinations and radiation exposure. The objective of our study was to audit the adequate filling of request forms for CT scans, received at Radiology department of a tertiary care hospital. **MATERIALS AND METHODS:** We scrutinized the CT scan request forms received at Radiology Department, Khyber Teaching Hospital, KPK, from 20<sup>th</sup> March-20<sup>th</sup> June 2015. The information including patient name, address, relevant clinical history, legibility of hand writing, and identity of the referring doctors were considered as the minimum contents of the request form which were recorded in a structured proforma and analyzed via SPSS-16. **RESULTS:** Of total 444 request forms, name of the patients was mentioned in all but address in 13% only. Clinical history was provided in 79.5%, probable clinical diagnosis was mentioned in 30%, and specific question was asked in 35%. The writing was illegible in 8.6% and non-standardized abbreviations were used in 6.5%. Renal functions were mentioned in only 1.5% of those scans requiring intravenous contrast. Referring clinician name was mentioned in 18% only, however signature was done in 89% of the request forms. **CONCLUSION:** Clinician's practice of filling the CT scan request forms was suboptimal which needs to be improved.

**Key words:** Clinical audit, Radiology request form, completion, CT scan.

## Introduction

Clinical audit is a systematic review and analysis of current practice against standards in order to improve the quality of care by implementing a change if relevant.<sup>1</sup> A radiology request form (RRF) is a clinical document completed by a licensed clinician. It represents a documented request to a radiologist and is usually made on a standard radiology request form. The RRF is one of the means of communication between radiologist and the referring clinicians. Its importance is highly underestimated.<sup>2</sup>

According to Radiation Protection Regulations, the referring clinician is supposed to justify the indication for radiological examination and provide the history of previous exposure if any. Inadequate information can reduce the value of the report and can also lead

to mistakes in patient identification and delay in returning reports to the correct destination.<sup>3</sup> Complete filling of the request form is of paramount importance in helping the radiologist give concise radiological diagnoses and avoid unhelpful radiological examinations and radiation exposure. It also indirectly helps to shorten the investigation time and improve the quality of patient care. The Royal College of Radiologists has recommended that all forms should be legibly and adequately filled to avoid any misinterpretation that may arise.<sup>4</sup>

Standard practice is that, all radiology request forms should mention the patient's name, age, address, telephone number, ward, clinical history, specific question to be answered, history of previous exposure /allergy, the name and signature of referring clinician and the name of the consultant responsible for patient's care.<sup>5</sup>

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Previous studies in literature have shown that up to 20% of radiographic examinations were clinically unhelpful because either their justification was inappropriate or were not needed at all.<sup>6</sup>

Prevalence of inadequately completed radiology request form has been shown to be a global problem<sup>7</sup> and local data on this subject is not available. We conducted this study to compare our local practices against standards and to suggest a change for improvement of patients care if relevant.

## Objective

To audit the adequate filling of CT scan request forms received at radiology department of a tertiary care hospital.

## Materials and Methods

We scrutinized the CT request forms sent from different clinical units to radiology department from 20<sup>th</sup> March to 20<sup>th</sup> June 2015. We recorded all the information provided in the conventional request forms. The variables of interest were; patient names, sex, address, clinical history, provisional diagnosis, legibility of hand writing, use of non-standardized abbreviations, history of allergy, renal functions, name of referring doctor and signature. These parameters were analyzed via spss-16. The results were presented as tables/graphs.

## Results

Of total 444 request forms, 50.6% were sent from various wards of our hospital, 18% from OPD, 13.25% from private clinics, 2.4% from ER, and in 15.6%, the source was not mentioned as shown in (Fig. 1). Name of the patients was mentioned in all, sex in 67% and address in 13% only. Clinical history was provided in 79.5%, probable clinical diagnosis was mentioned in 30%, and specific question was asked in 35%. The writing was illegible in 8.6% and non-standardized abbreviations were used in 6.5%. Renal functions

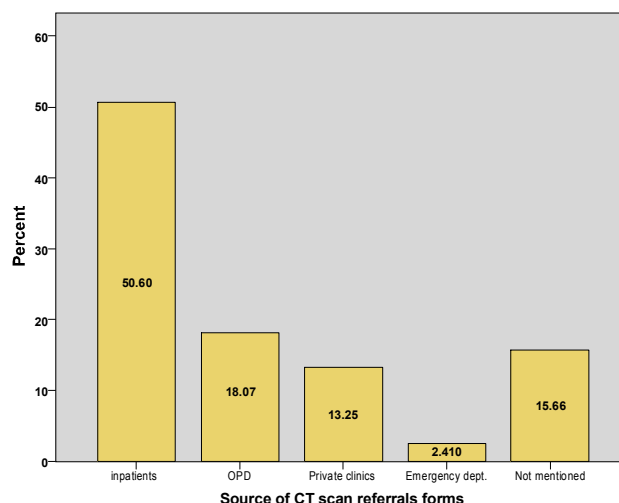


Figure 1: Source of CT scan request forms

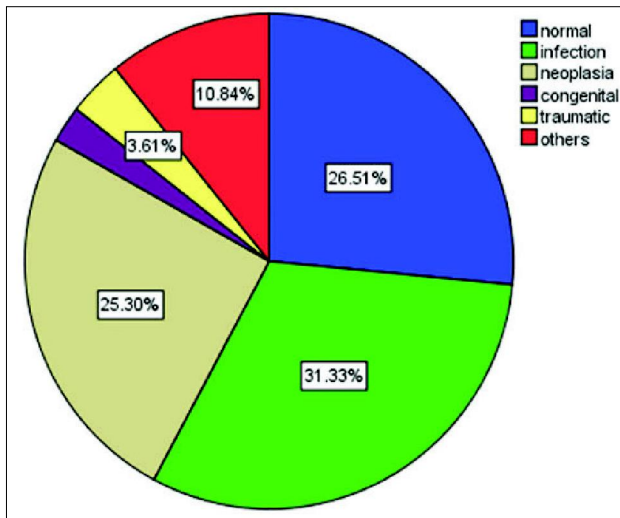
were mentioned in only 1.5% of those scans requiring intravenous contrast. History of allergy was missing in all forms. Referring clinician name was mentioned in 18% only, however signature was done in 89% of the request forms. These variables represent the minimum content of a CT scan request form and all are shown in (Tab. 1). Radiological reports were normal in 26.5%, favoring infection in 31.3%, neoplasm in 25.3%, congenital disorders in 2.4%, trauma in 3.6%, and the rest of 10.81% were having miscellaneous diagnoses (Fig. 2).

S.No.	Variables (content of the radiology request form)	Percentage
1	Name	100
2	Age	72
3	Sex	67
4	Address	13
5	illegible handwriting	8.6
6	Non Standard abbreviations	7.2
7	Clinical history provided	79.5
8	Specific question asked	35
9	Renal functions mentioned (when i.v contrast required)	1.5
10	Referring doctor's name	18
11	Doctor's signature	89

Table 1: Completion of various fields in CT scan request forms.

## Discussion

Clinicians usually need the help of radiological investigations in making various diagnoses. Radiological request form is usually the only means of communi-



**Figure 2:** Diagnostic outcome of CT scans requested

cation between a radiologist and a clinician because there is little opportunity to discuss cases by both parties. Adequate filling of RRFs is mandatory to get best results in terms of accurate diagnosis and to avoid un-necessary radiation exposure.

This audit has demonstrated that radiology request forms are inadequately filled. Many of the CT scans could have possibly been avoided.

The writing was illegible in 8.6% which is near to 7.3% and 9% reported in similar studies.<sup>8,9</sup> A higher percentage of 15% has also been reported by Jumah et al.<sup>10</sup> Illegible writing may lead to lack of understanding or misinterpretation of the request forms. The former leads to delay in carrying out the examination because the clinician needs to be contacted for clarification, while the latter can lead to a wrong examination being done, repeat examinations, and, ultimately, unnecessary radiation exposure.

The absence of demographic details may cause serious problems even in identifying the proper patient. Patient's name was the best filled field (100%), which is similar to 97.4% and 100% reported by other studies.<sup>11,12</sup> Address was documented in 13% which is reported as 10.68%, 13% and 39% in other studies.<sup>8,11,12</sup> Sex of the patients was entered in 67% which is lower than 95%, 97% and 99% shown in other studies.<sup>8,11,12</sup>

Evidence suggests that adequate clinical information is associated with accurate radiological report which

in turn help the referring clinician in management of the patient.<sup>13</sup> Adequate clinical information was provided in 79% and specific question was asked in 35% only. Royal college of radiologist has recommended that all radiology request forms should address questions posed by referring clinician to justify radiation exposure and help the radiologist narrow the differential diagnoses. Literature shows a highly variable percentage of asking specific question in radiology request forms i.e 1.4%, 54%, 72% and 90%.<sup>8,11,14,15</sup>

Comments on renal functions were documented in only 1.5% of the request forms sent for contrast enhanced CT scans. Contrast induced nephropathy is one of the leading causes of hospital-acquired acute kidney injury. It is associated with a significantly higher risk of in-hospital and 1-year mortality, even in patients who do not need dialysis. Subjecting the patients with pre-existing renal compromise to contrast may result in catastrophic results in the form of contrast induced nephropathy, a well-known entity.<sup>16</sup> It is important to know the name of the referring doctor so that he/she may be contacted if further clinical information is needed or if there is urgency of treatment as per radiologist assessment. Clinician name was mentioned only in 18% of the forms which is far less than 83%, 92% and 97% reported in literature. The signature which further authenticates the request was found in 89% which is near to 85%, 91%, 93% and 97% in other studies.<sup>5,12,14,17</sup>

Nearly one fourth (26%) of the CT scan reports were showing normal results, a potentially avoidable subset, suggesting inadequate clinical judgement on part of the clinicians. Literature shows that up to 20% of the radiological exposures are unhelpful.<sup>18</sup>

## Conclusion

Clinician's practice of filling the radiology request forms was inadequate which needs to be improved.

### RECOMMENDATIONS:

Clinician needs to be given feedback by radiologist to improve clinical judgement and avoid unnecessary radiological investigations. Proper standardized form

may be designed to replace the conventional laboratory forms to make sure all fields are filled adequately.

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