

**CLINICAL AUDIT****To Assess the Accuracy of Radiology Procedure Codes for Standardization and Structure of Radiology Department: A Clinical Audit**UMMARA SIDDIQUE UMER<sup>1</sup>, MUHAMMAD ASIF<sup>2</sup>, MUHAMMAD SALMAN RAFIQUE<sup>3</sup>, ABDULLAH SAFI<sup>4</sup>, MAHWISH JABEEN<sup>5</sup>, SANA KUNDI<sup>6</sup><sup>1</sup>Associate Professor Radiology, Rehman Medical Institute, Peshawar<sup>2</sup>Radiology Trainee, Rehman Medical Institute, Peshawar<sup>3</sup>Consultant Radiologist, Pakistan Kidney and Liver Institute and Research Center, Lahore<sup>4</sup>Assistant Professor Radiology, RMI, Peshawar<sup>5</sup>Assistant Professor Radiology, RMI, Peshawar<sup>6</sup>Consultant Radiologist, Pakistan Kidney and Liver Institute and Research Center, Lahore

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**ABSTRACT****Aim:** To see accuracy of radiology procedure codes for standardization and structure of radiology department**Methods:** 100 cases for each procedure i.e. radiology, fluoroscopy, MRI and CT scan were selected. Request forms were reviewed and the assigned codes were compared with the films of radiology on a system called picture archiving and communication system (PACS). This system determines the appropriate coding.**Results:** In this study, accurate coding in MRI, fluoroscopy, CT scan and X rays was 99%, 95%, 90% and 85% respectively according to local guidelines.**Conclusion:** This study concludes that MRI has maximum accuracy i.e. 99% and x rays have minimum i.e. 85%.**Keywords:** Codes, CT, MRI**INTRODUCTION**

Codes i.e. compact labels, are used by computers for identifying information. In hospital, a patient is given a specific code and this code is linked to all the visits and tests of the patient. Major function within the health information management is assignment of medical diagnosis and procedure codes for research and also for administrative and financial purposes.<sup>1</sup>

In radiology, codes can be either procedure codes identifying the type of examination or accession numbers representing the specific date or time of an examination. This study only focuses on the former, since the interchange of data depends on commonalities in examination type. For each imaging examination, there is typically an associated procedure code in the Digital Imaging and Communications in Medicine (DICOM) metadata. In clinical information system, there is use of procedure codes. and are a critical part of radiology processes. For automated identity of prior imaging studies and radiation dose tracking data, structured coding system was used.<sup>2</sup>

**METHODS**

In September, 2019, a study was done in radiology section of RMI, Peshawar. The procedure coding of MRI, CT scan, fluoroscopy and X rays were reviewed. 100 cases for every procedure were selected randomly from collected record of last 3 years. The request receipts were reviewed and codes were compared with the films of radiology on PACS system.

**RESULTS**

Ninety percent of the CT, 99% of the MRI, 95% of the Fluoroscopy, 90% of CT scan and 85% of X ray films were accurately coded according to local guidelines.

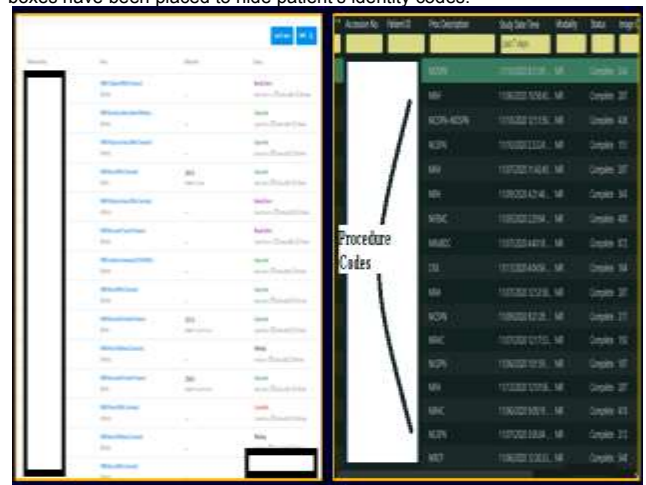
Table 1: Coding System

	CT scan	MRI	Fluoroscopy	X-rays
N=	100	100	100	100
Appropriate	90	99	95	85
Wrong codes	10	01	05	15
Results	10%	01%	05%	15%

Received on 12-09-2021

Accepted on 22-03-3033

Fig1: View of HIMS (left screen) and PACS (right screen) showing how the billing and procedure codes are visualized by the reporting radiologists. The boxes have been placed to hide patient's identity codes.

**DISCUSSION**

Physician advised Imaging and received by radiology department as a descriptive name e.g. CT Pelvis for right iliac fossa pain, X Ray chest PA and lateral and these are assessed by the radiology experts to decide the required protocol e.g. if order is of CT abdomen for abdominal pain and ultrasound showed lesions in liver then the ideal protocol would be CT Liver Dynamic, for which a specific code is entered in the system by the technologist performing the study.

It has been observed that prior practice and certain departments used vendor-provided and procedure codes. The main drawback of this being inability to be easily generalized, varied terms across sites and they may be incomplete, which is hurdle in standardization of radiology practice. A study done by Rubin DL showed that terminology regarding radiology can be translated into an ontology, a representation of terminologies that is both human-brows able and machine-processable.<sup>3</sup>

The strength for electronic exchange of clinical information is standardized radiology procedure codes. Ideally, 100% of the codes should be accurate as per locally set guidelines of each radiology department. Our study showed that most of the MRI

studies performed (99%) were accurately coded, whereas the radiography (X Ray) codes were the ones with least accuracy (85%) suggesting that X Ray technologists need to be more trained to stick to the codes list. One reason for least accuracy in radiography codes can be large patient inflow and technologist is bound to make some errors during code entry into the system e.g. writing X Ray CHEST instead of CHEST for the X RAY chest of patient. The other modality which had comparatively less accuracy was CT. The patient inflow in radiology for CT scans is second highest following X ray requests; again the reason for low accuracy appears to be large patient inflow related bound to make some errors. Provision of guidance to technologists is required how to adopt these codes and a repeat studies should be done.

This study showed the role of radiology procedure codes in the health care facility, current standards in radiology procedure coding and the challenges of adopting standardized codes. To our knowledge, no such study has been done before. Such studies should be done more often to ensure standardization of clinical and radiological practices for a smooth workflow.

### CONCLUSION

This study concludes that MRI has maximum accuracy i.e. 99% and x rays have minimum i.e. 85%.

**Conflict of interest:** Nil

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