

# USING DOPS (DIRECTLY OBSERVED PROCEDURAL SKILLS) FOR ASSESSMENT OF FLUOROSCOPIC PROFICIENCY OF RADIOLOGY RESIDENTS: INITIAL EXPERIENCE

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## ABSTRACT

**OBJECTIVE:** The purpose of this study is to assess feasibility and potential benefits of DOPS (Directly Observed Procedural Skills) in assessment of fluoroscopic proficiency of radiology residents in comparison with traditional end of rotation feedback. **MATERIAL AND METHODS:** The study was conducted in department of Radiology, Shifa International Hospital, Islamabad, Pakistan between January 2014 to December 2015. A fluoroscopic manual was designed by a senior radiologist in which departmental protocols of fluoroscopy procedures were described and was given to all radiology residents and faculty. A hands-on 3 day fluoroscopic work shop was conducted to ensure uniformity in image acquisition in fluoroscopic procedures. Later two Radiologists carried out DOPS assessment session. A single station was made with procedures performed on a mock patient (healthy volunteer) without active fluoroscopy. Assessment was marked on a pre designed Performa. A post DOPS questionnaire was given to participating residents to give their opinion on this newer system. **RESULTS:** Twelve out of a total of thirteen radiology residents were evaluated. Seventeen percent (n=2) of residents were ranked very good (can perform procedure independently), 42% (n=4) were ranked as good (can perform under indirect supervision), 33% (n=4) as satisfactory (can perform under direct supervision) and 8% (n=1) as below expectation (needs remedial work before handling patient) Ninety one percent (n=11) residents said that this new tool was effective in improving their fluoroscopic skills. All residents (n=12) agreed that DOPS is better than conventional end of rotation written feedback for fluoroscopy. **CONCLUSION:** DOPS has been found to be a much better assessment tool as compared to our conventional end of rotation written feedback for assessment of fluoroscopic proficiency of radiology residents.

**Keywords:** DOPS (Directly Observed Procedural Skills), fluoroscopic proficiency, radiology residents.

## Introduction

Different teaching methodologies and assessment strategies have been implemented over the past few decades across different specialties of Medicine. Each medical specialty faces its own unique challenges for the physicians undergoing training today. To meet the requirements and challenges of these changing roles, medical educationists and residency programs have devised or revised new techniques for training caregivers of tomorrow.<sup>1,2,3,4,5</sup>

Radiology training is undergoing similar changes and has evolved into a discipline with unique training demands as newer modalities are being developed at increasing pace with emphasis on patient safety. Fluoroscopy procedures compose a significant bulk of the daily work routine of radiologists. It is one of the more difficult subspecialties to master due to increased dependence on operator skill for obtaining good quality images with minimal radiation exposure.

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Although some market surveys<sup>6,7</sup> quote a shift in use of different radiology modalities in the West over the past few years due to changing dynamics of the radiology with more developments taking place in application of CT and MRI, these cannot replace the need of basic imaging modalities like fluoroscopy which have also undergone changes in their range of applications with increasing concerns regarding radiation safety. Socratic and didactic method of teaching carries a long tradition in history of medical education.

Fluoroscopy requires skill as well as knowledge for optimal diagnostic accuracy and safety. This makes fluoroscopy one of the difficult modalities to assess besides ultrasound which require evaluation of theory as well as skill to ensure competence. Ideally, the procedural efficiency of trainees should be objectively tracked and evaluated at regular intervals to ensure that training requirement and milestones are achieved as required. To cover both these aspects, DOPS seemed the most suitable evaluation tool. DOPS is an educational and assessment technique that has been in use for some time and has been adopted by training bodies in North America, Europe and Australia for workplace based assessment in Radiology termed as RAD-DOPS.<sup>8,9</sup> Although trainees undergo daily observation of their knowledge and skill by faculty, this does not follow a standardized pattern. This technique has been applied to different specialties in postgraduate medical education and training and although it has been proposed that it can be applied effectively in radiology as well,<sup>2</sup> we found no published data where DOPS has been practically applied to assess diagnostic fluoroscopic skills in radiology residents.

We carried out a pilot DOPS evaluation session for fluoroscopic procedures in our department to gauge its effectiveness as an assessment tool for trainees and to obtain feedback regarding its effectiveness from residents and faculty members. We share our initial experience of this educational and assessment tool in the context of monitoring training of residents in procedural efficiency of fluoroscopic procedures.

## Material and Methods

**Study setting:** The study was conducted in department of Radiology, Shifa International Hospital,

Islamabad, Pakistan between January 2014 to December 2015. We have 13 radiology residents in our department.

**Ethical Approval:** Ethical approval of the study was obtained from the Institutional Review Board (IRB No 380-229-2014)

**Problem Statement:** Our residency program follows a system-based approach to teaching. Our conventional approach of resident assessment relies on observation of residents by faculty members during rotations in different departments and providing end-of-month written feedback on standard feedback templates. This system worked fine in CT and MRI rotations where resident has to sit and report the findings however for fluoroscopy and ultrasound, both practical skill and theory needs to be assessed, the evaluation of which remained sub optimal. This created gaps in training and lack of confidence of residents regarding practical skills. Over the preceding few years the radiology faculty had noted a relative lack in confidence and expertise of trainees in fluoroscopy relating to both skill and interpretation as opposed to other modalities.

**Formulation of standardized protocols:** A fluoroscopic manual was designed by a senior radiologist with more than 4 years post fellowship experience in fluoroscopy, in which departmental protocols of fluoroscopy procedures were described and was given to all radiology residents and faculty. A 3 day workshop was organized in which commonly performed fluoroscopic procedures were explained in along with practical presentation of correct positioning on a healthy volunteer without active fluoroscopy. Standardized protocols of procedural details and image acquisition were reviewed in this workshop. Increased emphasis was placed on following protocols to acquire adequate images with lowest possible radiation exposure.

**Conducting DOPS evaluation:** DOPS evaluation session was conducted as a tool for assessing resident s fluoroscopic proficiency. Two radiologists, with more than 3 years post fellowship experience in fluoroscopy, carried out DOPS assessment session. A healthy volunteer was selected as a mock patient.

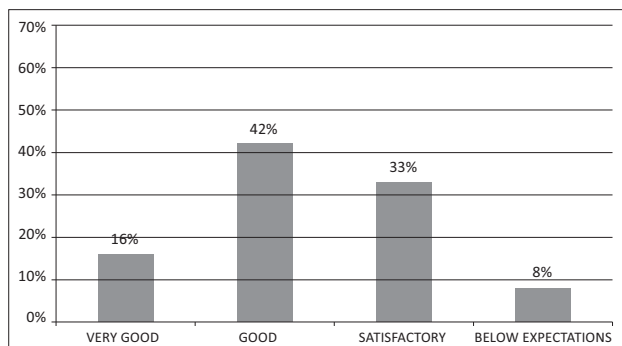
The residents were asked to proceed with a certain fluoroscopy procedure as done in daily routine, starting from history taking to actual procedure. No active fluoroscopy was used during these mock assessments. The residents were also assessed for their knowledge relating to different procedures by viva session at the end. The residents were then marked separately by both faculty members on pre designed performa. The final result placed each resident in one of four categories: very good (can perform procedure independently), good (can perform under indirect supervision), satisfactory (can perform under direct supervision) and below expectation (needs remedial work before handling patient).

Each resident was provided with feedback at the end of the evaluation. A post-implementation survey was carried out using a predesigned questionnaire.

## Results

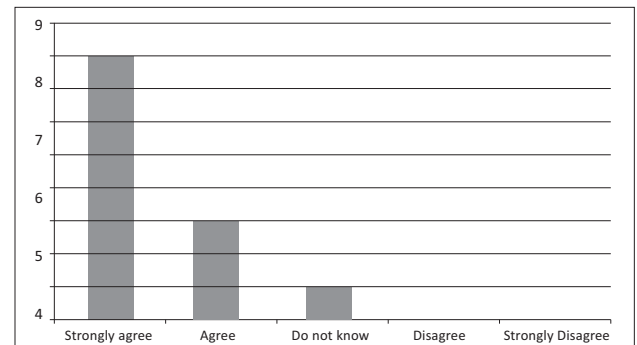
Twelve out of thirteen radiology residents were evaluated. Seventeen percent (n=2) of residents were ranked very good (can perform procedure independently), 42% (n=4) were ranked as good (can perform under indirect supervision), 33% (n=4) as satisfactory (can perform under direct supervision) and 8% (n=1) as below expectation. (Needs remedial work before handling patient) (Fig.1).

A post DOPS questionnaire was given to the participating residents to give their opinion on this newer system with 100% response rate (n=12). Ninety one percent (n=11) residents said that this new tool

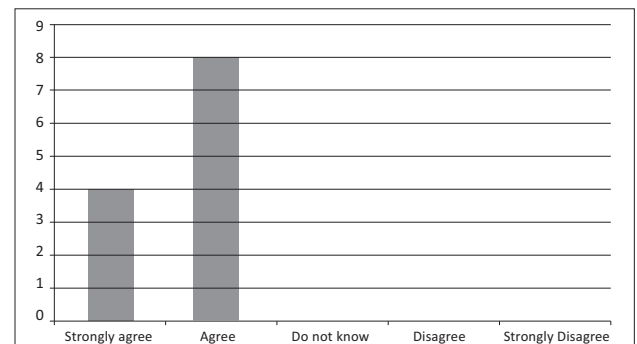


**Figure 1:** Graph showing the performance of residents in Fluoroscopic DOPS evaluation.

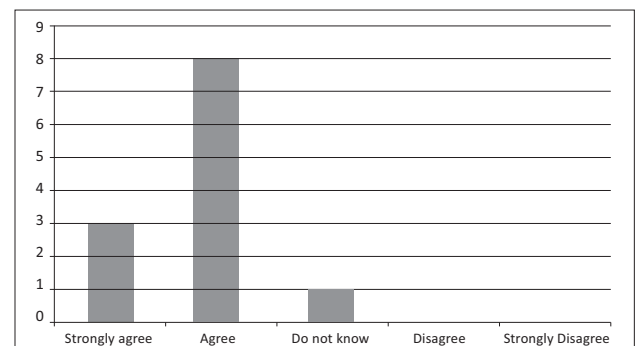
was effective in improving their fluoroscopic skills (Fig. 2) and 100% (n=12) thought that this session had allowed them to identify their short comings related to fluoroscopic procedures (Fig. 3). Regarding adequacy of fluoroscopic manual, 91% (n=11) agreed that it provides adequate baseline for performing good quality fluoroscopic procedures (Fig. 4). All residents (n=12) agreed that DOPS is better than



**Figure 2:** Graph depicting resident s response regarding effectiveness of DOPS in improving their fluoroscopic skills.

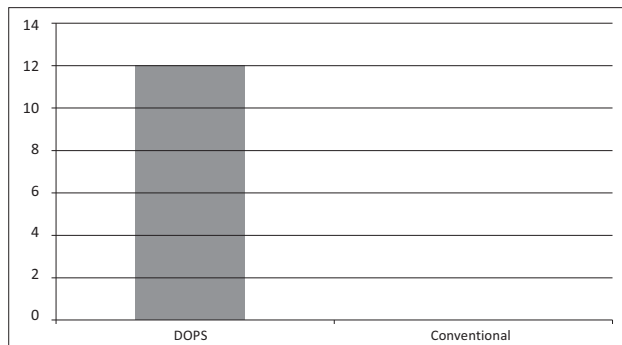


**Figure 3:** Graph depicting response of residents to the question 'Has this session allowed them to identify their short-comings related to fluoroscopic procedures.'



**Figure 4:** Graph depicting resident s response regarding adequacy of residency manual for providing adequate baseline for performing good quality Fluoroscopic procedures.

conventional end of rotation written feedback for fluoroscopy and should be implemented in future. (Fig. 5).



**Figure 5:** Graph depicting resident's views about which assessment tool is better for their fluoroscopic evaluation: DOPS versus conventional end of rotation written feedback.

## Discussion

The process of educating and assessing physicians in training today is continuously evolving at the same pace as the technological developments are taking place. Conventional teaching methods have undergone intense scrutiny and critical analysis and have been found suboptimal to the current training need of radiologists. There has been a whole-sale shift of education towards an outcome oriented approach in the past few decades. This increasing pressure has produced different methods of assessment some of which have been specifically designed for radiology e.g. simulation based training techniques, RAD-DOPS, CBD, MSF, Mini-IPX etc. <sup>8,9,10,11,12,13</sup> RAD-DOPS is one of the few tools that have been specially designed for assessing radiologists. Although introduced and implemented early in North America,<sup>8,9</sup> these techniques have taken more time for acceptance by European countries.

Ongoing efforts at national level in UK for initiating implementation of RAD-DOPS as a component of workplace based assessment by the radiology training bodies and national health regulatory authorities is in progress.<sup>10,11,12,13,14</sup> DOPS is considered as a valuable tool for the assessment of diagnostic and interventional radiologic procedures.<sup>2,15</sup>

There is a general consensus in our department that resident training in fluoroscopy has benefited from this project. The curriculum has been standardized

with increased emphasis on procedures residents are more likely to encounter in routine everyday setting. This method can be used to supplement clinical teaching and to evaluate residents. We believe that in addition to individual resident improvement this method can ultimately allow us to raise the quality benchmark of our patient care and service by allowing us to identify weaknesses and inadequacies and modify training curriculum priorities accordingly. The application of DOPS to fluoroscopy was our second experience with this educational technique. Last year we did a pilot DOPS study for assessment of pre call proficiency of ultrasound which received positive feedback from residents as well as faculty and we presented our ultrasound DOPS pilot study as a poster in European congress of Radiology, 2014 (ECR).<sup>16</sup> Collaboration with other radiology training programs for possible expansion of similar programs and sharing the results may help clarify our combined path forward.

Being a single centre study with relatively small number of participants is a limitation in our study. Subjective assessment by examiners created some degree of bias. Despite these limitations, we feel that application of DOPS for ultrasound and fluoroscopic evaluation is a step forward towards our goal of providing safe care to our patients.

## Conclusion

Compared to our conventional end of rotation written feedback, using DOPS for fluoroscopic proficiency assessment of radiology residents has been judged to be a useful assessment tool in the initial analysis.

**Conflict of Interest:** None

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