

### **Project Title**

Improving plain film radiography quality

### **Project Lead and Members**

- Magdalene Wong, Department of Diagnostic Radiology / Manager
- Clint Ong, Department of Diagnostic Radiology / Principal Radiographer
- Chong Chun Meng, Department of Diagnostic Radiology / Senior Radiographer

### **Organisation(s) Involved**

Tan Tock Seng Hospital

### **Project Period**

Start date: Sep 2011

### **Additional Information**

- Oral Presentation at 19<sup>th</sup> Asia-Australasia Conference of Radiological Technologists (AACRT) 2013, Chiangmai Thailand

### **Project Category**

New Pedagogy, Quality Improvement

### **Keywords**

Tan Tock Seng Hospital, Diagnostic Radiology, Quality Improvement, New Pedagogy, Job Effectiveness, Quality Standard, Staff Competency, Standardised Competency Evaluation, Objective Scoring Method, Objective Feedback, Accurate Radiology Diagnosis, Radiation Safety, International Standard Practice, Plain Film Radiology, Radiographic Imaging Quality

### **Name and Email of Project Contact Person(s)**

Name: Magdalene Wong

Email: Magdalene\_Wong@ttsh.com.sg

## **Background Information**

Project Title                      **Improving plain film radiography quality**

Date Project Started              September 2011

Enhancements made (for projects that did not start operations between January 2012 to May 2013)

Updated auditing structure

### **Key staff involved in the project**

1. Name                                Magdalene Wong

Department/Function      Department of Diagnostic Radiology / Manager

2. Name                                Clint Ong

Department/Function      Department of Diagnostic Radiology / Principal Radiographer

3. Name                                Chong Chun Meng

Department/Function      Department of Diagnostic Radiology / Senior Radiographer

Plain film radiography is the core skill of all radiographers and accounts for the majority of all radiological investigations done for our patients in Tan Tock Seng Hospital (TTSH), Singapore. There are 120 radiographers in TTSH Department of Diagnostic Radiology. Radiographers in the department range from fresh graduates to veterans who have been practicing for 45 years. Also, the radiographers are from very different training backgrounds. This diversity will inevitably result in a variation in the quality of plain film radiographs.

To measure and monitor this improvement, some form of quantitative data had to be collected. However, plain film radiographs quality audits was previously not a formalized process. Random checks by principal/senior radiographers were qualitative and only categorized radiographs as "good", "ok" and "bad" images. There was also no formal documentation of the auditing process. The only forms of feedback radiographers received on their radiographs were mainly from radiologists who were eventually reporting the radiographs and casual remarks from seniors.

#### **Aims:**

Quality requires constant learning and improvement. The team aimed to identify a measurable baseline for quality standard in plain film radiography by auditing plain film radiographs; apply interventions in the form of teaching and learning to improve quality and monitor improvement over a one-year period.

#### **Auditing and measuring of quality:**

A detailed and objective scoring method was developed based on the "traditional" qualitative evaluation criteria used in radiography education internationally. Scores are given to the "traditionally" qualitative criteria for quantification of the quality. The data is then collated and processed, an audit score is then generated as a percentage of the maximum possible score of the month.

## Inventions:

Drawing information from the audits, personalized teaching is rendered to underperforming radiographers. General areas of weakness are also identified and made-to-measure group tutorial sessions with hands on components are designed to radiographers improve.

Word count: 302 / 350

## 2. Results:

Over a year period, there was an overall and sustained improvement in the quality score from 65.3% in September 2011 to 76.9% in September 2012. There is also a tightening of the spread of radiographic quality. The deviation range of audit scores was  $\pm 12\%$  in September 2011 and has improved to  $\pm 6\%$  in September 2012. This indicates that not only has that overall standard improved, more radiographers are performing within the "good performance" range. The improved plain film radiographic quality, along with other improvements in the DIR, the patients of TTSH can enjoy faster and more accurate diagnosis higher quality radiographers. Cost effectiveness of healthcare is improved and radiation safety is also enhanced with less repeat X-rays.

Word count: 117 / 200

## 3. Methodology:

The method of measuring radiographic quality was novel and never before did radiographers get such objective feedback about their work. Radiographers gained more confidence and are more intrinsically motivated to improve their professional skills. With higher skill levels and improved quality of radiographic imaging, care rendered by the downstream caregivers can be improved too.

The analysis tool was built from scratch and will certainly form a guide, even framework, for all diagnostic radiology departments internationally to measure their radiographic quality.

Word count: 80 / 200

## 4. Results:

There was measurable and perceivable improvement in radiographic imaging quality. Radiologists reporting the radiographs made less complaint and have been reporting and diagnosing with more confidence. Clinicians have also generally commented on the improved radiographs quality.

Word count: 36 / 150

## 5. Project team:

A quality committee consisted of the department manager, 3 principal radiographers and 1 senior radiographer was formed. The team identified that there was a wide spread in the quality of the radiographs produced by the radiographers of varying competence and experience. The project was designed with a mission to deliver the best possible and continuous improvement in radiographic quality. The project was designed to

1. Develop an assessment method that can be standardized
2. Introduce appropriate interventions based on targeted area of weaknesses
3. Monitor and review the effectiveness of interventions introduced

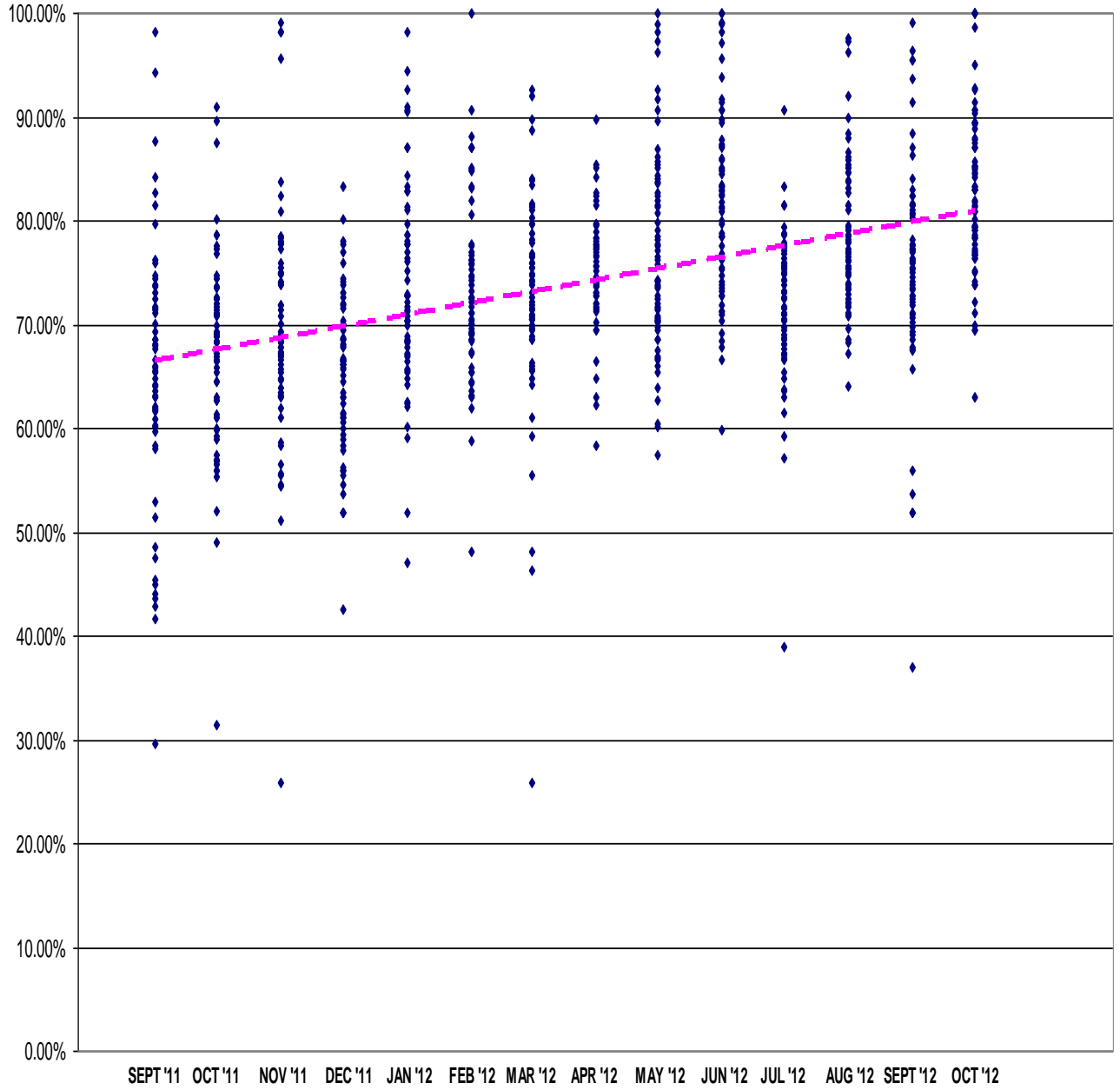
Word count: 92 / 200

#### 6. Other Information:

This project was submitted and accepted for an oral presentation at the 2013 Asia-Australasia Conference for Radiologic Technologist, in Chang Mai, Thailand. After the presentation, there was overwhelming praise and requests for reproduction of the methodology by the international crowd. Many have requested that this project be published in *The Radiographer*, the top radiography journal internationally. Many have commented on the potential for this project to become standard practice internationally to measure radiographic quality.

Word count: 66 / 200

# Overall random audit score Sept 2011 - Oct 2012 with regression line





## 19th AACRT

### 2013 Asia-Australasia Conference of Radiological Technologists

January, 16-18th 2013. Lotus Pang Suan Kaew, Chiangmai, Thailand.

Dear Chong Chun Meng

Senior Radiographer, Tan Tock Seng Hospital, Singapore

Title: Improving plain film radiography quality through audits

We are pleased to inform you that your abstract for an oral presentation has been accepted. Hence, you are cordially invited to present your paper at the 2013 Asia-Australasia Conference of Radiological Technologists.

Further correspondence and the scheduled session time for your presentation will be sent to you prior to the meeting. We would like to advise that this oral presentation would be allocated **15 minutes in total**, which should include 3 minutes for questions.

We look forward to your participation at the 2013 AACRT conference.

The conference organizers look forward to receiving your registration.  
The registration form can be downloaded from the website.

For updates on the AACRT please visit the website <http://www.2013aacrt.org>

Sincerely yours,

Yudthaphon Vichianin, Ph.D.  
AACRT Organizing committee

Department of Radiological Technology  
Faculty of Medical Technology, fl.10  
#2 Prannok Road, Siriraj  
Bangkoknoi, Bangkok  
10700 Thailand

Tel. +662 419 7173

Fax. +662 412 4110

Email. [Yudthaphon.vic@mahidol.ac.th](mailto:Yudthaphon.vic@mahidol.ac.th)

---