MANUAL FOR CHEST RADIOGRAPH DICTATION

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BACKGROUND

- The clinical report is an essential part of the service that radiologists provide to patients and referring physicians by providing the following:
  - Pertinent assessment of the presenting pathology
  - Interpretation of the progression or resolution of a disease
- The written communication in the radiology reports should be:
  - Uniform
  - Comprehensive
  - Easily understood
- For diagnostic radiology trainees, the learning curve is steep, particularly in chest radiographs as the findings are not always straightforward.

OBJECTIVE

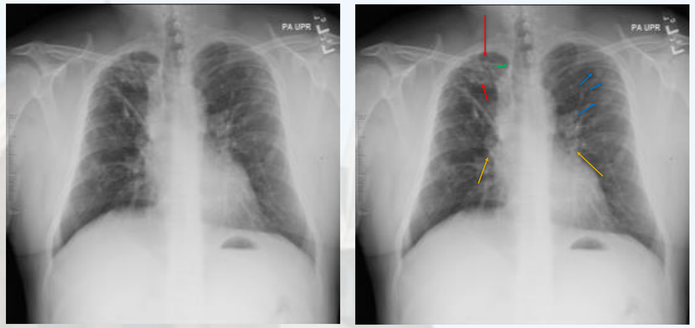
- To provide a systemic method to interpret chest radiographs
- To describe the essential components of a chest radiology report
- To provide descriptive terminologies for common findings on chest radiographs along with their differentials.

MATERIALS & METHODS

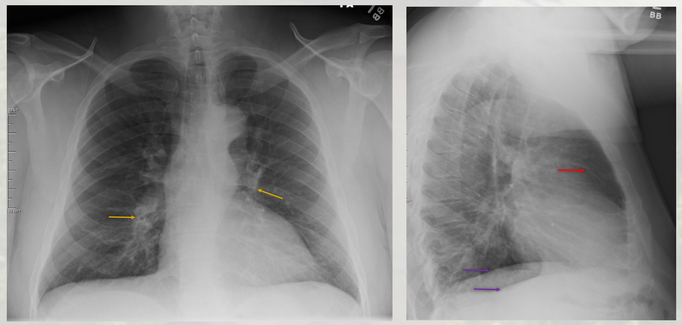
- 40 commonly encountered chest radiographs were obtained at Detroit Medical Center (DMC) by 4 residents.
- Each resident worked through each case independently and provided a systematic method to assess and interpret the case via a written step-by-step analysis to include:
  - Description of the findings, reasoning for each terminology used, explanation for each essential components in a radiology report, and provide differentials for each findings.
- The clarity and accuracy of the case analysis was reviewed and corrected when applicable by staff radiologists.
- The chest radiograph manual was given to the first-year radiology residents prior to the start of their chest rotation and after they completed a pre-intervention survey, which **subjectively** assess their comfort levels in the following areas:
  - Knowledge of essential components of a radiology report
  - Ability to perform a systematic method to interpret chest radiographs
  - Ability to understand commonly used terminology
  - Ability to describe abnormal findings and provide common differentials
- These areas are scored from 1 to 5 with 5 indicating the highest comfort level
- A post-intervention survey was given at the end of the chest rotation to assess the progression of the first-year radiology residents' comfort level.
- The overall average evaluation scores at the end of the chest rotation were compared between junior residents who did receive the chest radiology manual versus junior residents who did not receive the chest radiology manual. Staff radiologists **objectively** evaluate the performance of each junior residents and were blinded from the intervention and non-intervention groups.
  - Residents were evaluated from a scale of 1 to 4 with 4 indicating superior performance.

CHEST RADIOGRAPH MANUAL

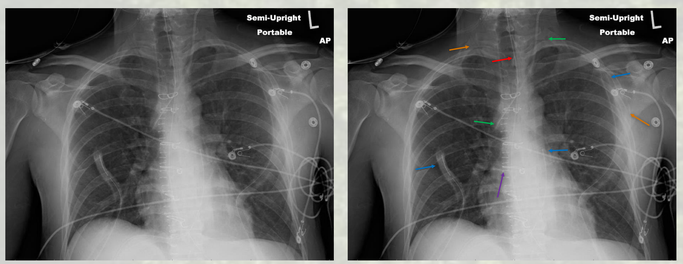
- Each case below is an example from the chest radiograph manual
- Some of which are with and without arrows to determine if the resident confidently identified the findings.



Example 1 – Active pulmonary tuberculosis
- Ill-defined nodular densities in the left upper lobe (blue arrows)
- Linear scars and tiny nodular densities are present in the right upper lobe (red arrows)
- Right paratracheal stripe is thickened (green arrow)
- Bilateral hilar enlargement representing adenopathy (orange arrows)



Example 2 – Chronic obstructive pulmonary disease (COPD)
- Large central pulmonary vasculature (orange arrows)
- Pruning of the distal vessels
- Flattening of the diaphragm (purple arrows)
- Increase in the retrosternal clear-space (red arrow)



Example 3 – Hemopericardium status post chest tube placement
- Mediastinal drainage catheter and bilateral chest tubes (blue arrows)
- Left internal jugular catheter terminates at the superior vena cava (green arrows)
- Nasogastric tube coursing towards the stomach (red arrow)
- Multiple skin stapes and sternotomy wires (purple arrow)
- Subcutaneous air and 4th left lateral rib fracture (orange arrows)

RESULTS

Table 1: Pre– and Post–Intervention of junior residents who received chest radiograph manual

Areas Scored	Pre-Intervention	Post-Intervention	p-value
Knowledge of essential components of a radiology report	3.57	4.71	<0.05
Ability to perform a systematic method to interpret chest radiographs	3.29	5.00	<0.05
Ability to understand commonly used terminology	3.00	4.00	<0.05
Ability to describe abnormal findings	2.57	4.29	<0.05
Ability to provide common differentials	3.00	4.00	<0.05
Overall average scores	**3.05**	**4.45**	<0.05

Table 2: Intervention vs Non-intervention

Areas Scored	Intervention	Non-Intervention	p-value
Overall average evaluation scores	2.8	1.9	<0.05

Intervention group: Junior residents who received the chest radiology manual
Non-intervention group: Junior residents who did not received the chest radiology manual
The junior resident's demographics including age and USMLE 1 and 2 scores were not statistically different (p>0.05).

CONCLUSION

- Novice radiology trainees show marked improvements in knowledge and communication when a basic guide is provided early in their residency training.
- For future considerations, we would like to elaborate this intervention to different radiographs including abdominal and extremities, as well as different modalities including computed tomography, magnetic resonance imaging, nuclear medicine, and ultrasound in their respective fields of imaging.

REFERENCES

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