Better Interpretation of Reports

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Goals for Today

• Improve understanding of radiology reports
• Learn key words to cue to an outcome
• Learn interchangeable words that may be used
• Review the above in context of the NSQIP definitions
Outline

- Pneumonia
- Pulmonary embolus
- DVT
- Deep incisional SSI
A. **Radiology:**

**ONE** definitive chest radiological exam (x-ray or CT)* with at least **ONE** of the following:
- New or progressive and persistent infiltrate
- Consolidation or opacity
- Cavitation

*Note: In patients with underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), **two or more serial chest radiological exams (x-ray or CT)** are required. The two exams should both confirm the diagnosis or the first exam should serve as a baseline exam which allows the second exam to establish the definitive new diagnosis. Postoperatively, serial radiological exams should be taken no less than 12 hours apart, but not more than 7 days apart. In contrast, a preoperative x-ray used as a baseline must have been obtained within 30 days of the principal operative procedure or at the time the patient is being considered a candidate for surgery.
Other considerations

Scenarios to clarify (Assign Variable):
- If the patient has aspiration pneumonitis or aspiration pneumonia and meets the criteria of the pneumonia definition

Scenarios to clarify (Do Not Assign Variable):
- Documentation of airspace disease and densities on an x-ray would not qualify. Airspace disease may be referring to infection. If this is not clearly defined by the radiologist this description cannot be used. Densities may be referring to tumors rather than evidence of infection.
- A sputum culture is not considered a lower respiratory tract (LRT) specimen and cannot be utilized to assign pneumonia.
- Pneumonia progressing to another lobe is not a new pneumonia.
- X-rays that show possible pneumonia without clear documentation of opacity, cavitation, infiltrate, or consolidation
Example 1

XRAY POD#4

Findings:

Compared to the prior x-ray, there is now *patchy consolidation* within the left lower lobe which may relate to aspiration, developing pneumonia or atelectasis. A small left sided *pleural effusion* is present. The right lung and pleural space remain clear. The cardiopericardial silhouette and mediastinal contours are unremarkable.
Normal lungs
Atelectasis
Patchy consolidation
Pleural effusion
Example 2

CT Chest POD #2

Findings:
No pulmonary embolus. Bilateral pleural effusions, small moderate volume. Associated subsegmental atelectasis. Relatively minimal patchy ground-glass attenuation including rights upper lobe and right lower lobe, nonspecific, in the appropriate context could represent pneumonia. No pericardial effusion or enlarged lymphadenopathy. Pacemaker in place.

XRAY POD#6

Findings:
Pacemaker with a single ventricular lead. Mild cardiomegaly not significantly change from remote previous from October 2011. Small bilateral pleural effusions. There has been moderate clearing of the ground-glass infiltrate evident on recent CT, however with a small amount of ground-glass persisting right basal region – nonspecific – consistent with resolving failure or infection.
Example 3

OR Date: August 4\textsuperscript{th}

Pre-Op CT July 29\textsuperscript{th}:
CT OF CHEST

Linearity in the left lung base probably reflect \textit{subsegmental atelectasis}. Evidence of bronchiectasis in left lower lobe noted. Areas of ground-glass attenuation likely represent areas of \textit{subsegmental atelectasis} in lingula, and right perihilar region. 

\textit{Tiny nodule identified in anterior aspect of right upper lobe} (Series 3, Image 46), 4 mm in size is noted.

Significant mass or other pulmonary nodule is not identified.

Degenerative change of thoracolumbar spine. Atherosclerosis of aorta, coronary arteries, as well as valvular calcification is identified.

Within the mediastinum, atherosclerosis of aorta is seen. Ascending aorta is larger than descending aorta, suspicious for ectasia, transverse dimension of ascending aorta up to 3.9 cm.

Probable node identified anterior to the main pulmonary artery (Series 601, Image 25) is seen. I cannot rule out pathologic node. It is 12.5 mm in short axis.

Additional probable lymphadenopathy in the mediastinum is not definitely seen.
Ground glass opacities
Pre-op CXR: Aug 2\textsuperscript{nd}
A right PICC line has been inserted. The tip is in the SVC near the junction with right atrium. No pneumothorax. No adverse change compared to the CT study of July 29.

Pre-op CXR Aug 3\textsuperscript{rd}
No significant interval changes

Post-op CXR Aug 4\textsuperscript{th}
The superior aspect of the left lung apex is excluded. There is a suspicion of consolidation and/or atelectatic changes within the left lower lobe. A central venous catheter is also seen with its distal end in the superior vena cava. This likely arises from the right jugular vein.

Post op CXR Aug 5\textsuperscript{th}
No significant interval changes

Post op CXR Aug 6\textsuperscript{th}
No significant interval changes
Post op CXR Aug 7th
Portable AP upright view.
Right jugular line has been removed.
Mediastinal, hilar and cardiac silhouettes are normal.
The left lower lobe atelectasis has improved. Followup exam recommended.

Post op CXR Aug 8th
No significant interval changes

Post op CXR Aug 9th
The right PICC line is unchanged.
Opacification at the left lung base is similar to previous studies. The lungs are otherwise clear.
The cardiomediastinal silhouette is enlarged, but stable.

Post op CXR Aug 10th
The right PICC line is unchanged. There is persisting opacity at the left lung base, similar to previous. No additional interval change is noted.

Post op CXR Aug 11th
The right PICC line is unchanged. Subtle opacity of the left lung base is again suspected, although it is unclear whether this represents atelectasis, pneumonia, or soft tissue artifact. There is likely a small left pleural effusion, similar to previous. No further interval change.
Pulmonary Embolism

Criteria: A pulmonary embolism must be noted within 30 days after the principal operative procedure AND the following criteria, A AND B below:

A. New diagnosis of a new blood clot in a pulmonary artery

AND

B. The patient has a V-Q scan interpreted as high probability of pulmonary embolism or a positive CT exam, TEE, pulmonary arteriogram, CT angiogram, or any other definitive imaging modality (including direct pathology examination such as autopsy)
Pulmonary embolism
Vein Thombosis

Criteria: Must be noted within 30 days after the principal operative procedure AND one of the following A or B below:

A. New Diagnosis of a [new] venous thrombosis (superficial or deep), confirmed by a duplex, venogram, CT scan, or any other definitive imaging modality (including direct pathology examination such as autopsy) AND the patient must be treated with anticoagulation therapy and/or placement of a vena cava filter or clipping of the vena cava, or the record indicates *that treatment was warranted but there was no additional appropriate treatment option available.*

OR

B. *As per (A) above,* but the patient or *decisionmaker* has refused treatment. There must be documentation in the medical record of the [patient’s] refusal of treatment.
Deep Incisional SSI

Criteria: An infection that occurs at the surgical site within 30 days after the principal operative procedure \textbf{AND} involves deep soft tissues \textbf{AND} at least \textbf{ONE} of the following:

A. Purulent drainage from the deep incision but not from the organ/space component of the surgical site

B. A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least one of the following signs or symptoms: fever (> 38\degree C), localized pain, or tenderness, unless the site is culture-negative

C. An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination

D. Diagnosis of a deep incision SSI by a surgeon or attending physician

Scenarios to clarify (Assign Variable):
- Report an infection that involves both superficial and deep incision sites as deep incisional SSI
- Report an organ/space SSI that drains through the incision as a deep incisional SSI
Organ Space SSI

Criteria: An infection that occurs within 30 days after the principal operative procedure AND involves any of the anatomy (e.g., organs or spaces), other than the incision, which was opened or manipulated during the operation AND at least ONE of the following:

A. Purulent drainage from a drain that is placed through a stab wound into the organ/space. This does not apply to drains placed during the principal operative procedure, which are continually in place, with continual evidence of drainage/infection since the time of the principal operative procedure.

B. Organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space.

C. An abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination.

D. Diagnosis of an organ/space SSI by a surgeon or attending physician.
Other considerations

Scenarios to clarify (Assign Variable):
- Anastomotic leaks involving the GI or GU system or which involve enteric contents

Scenarios to clarify (Do Not Assign Variable):
- Report an organ/space SSI that drains through the incision as a deep incisional SSI
- Fistulas alone, unless they independently meet the other criteria listed above
- Anastomotic leaks involving vasculature (e.g. lower extremity bypass), unless one of the 4 criteria above is met

<table>
<thead>
<tr>
<th>Site-Specific Classifications of Organ/Space Surgical Site Infection</th>
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<tbody>
<tr>
<td>Arterial or venous infection</td>
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<tr>
<td>Breast abscess or mastitis</td>
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<tr>
<td>Disc space</td>
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<tr>
<td>Ear, mastoid</td>
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<tr>
<td>Endocarditis</td>
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<tr>
<td>Endometritis</td>
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<td>Eye, other than conjunctivitis</td>
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<tr>
<td>Gastrointestinal tract</td>
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<tr>
<td>Intra-abdominal, not specified elsewhere</td>
</tr>
<tr>
<td>Intracranial, brain abscess or dura</td>
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<tr>
<td>Joint or bursa</td>
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Example 1

CT abdomen pelvis with IV contrast

Comparison: Pre-op CT
History: ? abscess post appendectomy

Findings:
No intra-abdominal free air. There has been interval resection of the appendix. In the right lower quadrant on the region of the anastomotic staples, there is a small 2.5 x 1.6 cm fluid collection. No gas locules or significant enhancement is present to suggest abscess. No free fluid within the pelvis.
Free fluid
Abscess
Example 2

August 13: CT abdomen pelvis with oral and IV contrast

Comparison: Pre-op CT
History: recent surgery for rectal carcinoma, ? wound infection, ? rectovaginal fistula

Findings:
Extensive extraluminal presacral gas is present extending proximally from a dehiscent low rectal anastomosis. Given the provided history of discharge per vagina, there is probable rectovaginal fistula. A small amount of expected presacral stranding is present. The uterus is surgically absent.
The right mid abdominal defunctioning ileostomy is noted with no bowel obstruction, new focal wall thickening, ascites, adenopathy or drainable abscess collection.
August 19: CT abdomen pelvis

Comparison: CT August 13

**Findings:**
New since prior study, left lower quadrant ostomy with residual postsurgical changes right lower abdominal wall.
Since the previous study, decrease in volume of pelvic free air. There is a small volume of extraluminal fluid present within the lower abdomen and pelvis, including presacral region, as well as minimally within left flank. There is an approximately 1.7 x 3.8 cm presacral collection which is defined, containing a couple of possible extraluminal foci of air and ruling out small abscess in this location is difficult.
Example 3

Sept 7: CT abdomen pelvis

Comparison: August 25
Reason for Exam; 8 days post partial colectomy

**Findings:**
There is a large volume of *free intraperitoneal gas and fluid* with *diffuse peritoneal enhancement*, consistent with bowel perforation. The perforation most likely relates to the right hemicolecotomy surgical anastomosis.
There is an approximate 6.4 x 1.9 x 7.1 cm dense retroperitoneal collection posterolateral to the right kidney which may represent small retroperitoneal hematoma.
Sept 16: CT abdomen pelvis

Comparison: September 7
Reason for Exam: ? Abscess

Findings:
*Large abscess collection* right paracolic gutter region, approximately 13 cm longitudinal and 8 x 8 cm in axial dimension, with narrow extension extending right subdiaphragmatic. There is a small amount of gas within this collected, decreased since Sept 7 previous, and with there is no longer gross free peritoneal gas. Also noted is peritoneal fluid within pelvis not appearing focally localized small in volume than right pericolic gutter.
October 5: CT abdomen pelvis

Comparison: Septemeber 16
Reason for Exam: increasing left side abdo pain & nausea

Findings:
The previous large abscess in the right paracolic gutter region was percutaneously drained, has almost resolved, measuring only 1.9 x 1.3 x 4.3 cm on today’s study. Only a 1.5cm focus of fluid collection persists over the dome of the right liver. Only a small fluid collection persists in the pelvis superior to the urinary bladder measuring 1.1 x 4.0 x 1.4 cm, markedly decreased from previous.