RITE

INCREASE THE PERCENTAGE OF EXAMS THAT HAVE ADEQUATE REASONS FOR EXAM INFORMATION

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Problem Statement

A large percentage of plain films ordered through the ICU contain inappropriate or inaccurate indications. This leads to increased time spent per study, misinterpretation of the exam and in some instances unanswered clinical inquiries.

Background

Upon further investigation, it was found that plain films were ordered in batches through a single epic order. A single indication was given to the order and applied to all exams. For example, many times the initial indication for an exam was “chest tube”, but the chest tube was taken out the next day. Despite the tubes removal, the remainder of exams in the order would have indications of “chest tube”. This lead to confusion and time wasted contacting ordering providers to ensure that the patients chest tube had not dislodged.

SMART Goal

Our goal was to decrease inadequate exam indications from 64% to less than 10% by September 1, 2016. The scope is limited to SICU and MICU for chest radiographs and KUBs.
Example

Reason for the exam: Intubated

Clinical histories are important!

No visualized Endotracheal tube

Foreign body
Cause Root Analysis

Intensive Care Unit
- Multiple ordering physicians
- Residents change every month
- MDs & RNs are very busy
- Training deficit

Radiology
- Techs are not empowered
- No feedback mechanism
- No protocoling for plain films

Inappropriate CXR

ACR Appropriateness Criteria
ATS Appropriateness Criteria
ICU Attending Criteria

Appropriateness

Decision support tools
- One order lasts multiple days
- No preset indications

Software
### Key Drivers

- **Radiologists**
  - Discuss with ordering providers better ways to ensure that exam indications are regularly updated and reflect the patients clinical status or the providers clinical inquiry

- **Ordering providers**
  - Post the ACR Appropriateness Criteria for ICU plain film examinations
  - Weekly visits to MICU and SICU reinforcing education and providing feedback
  - Continue with daily monitoring of at least 20 plain films for analysis of adequate reason for the exam.

- **Nursing**
  - Take responsibility for updating medical indication based on patient condition

- **Quality management personnel**
  - Continuous monitoring that the plan is effective
CHEST X-RAYS IN THE ICU

Eliminating routine daily chest radiographs did not affect mortality, length of stay in the hospital or ICU, or ventilator days (Oba 2010).

This represents a statistically significant 32% reduction in the use of chest radiographs without sacrificing quality of care or safety (Hejblum 2009).

Decreased resource utilization in ICUs employing an indication-driven chest radiograph ordering pattern (Hejblum 2009).

See ACR Appropriateness Criteria for further details regarding intensive care unit patients.

Example **Appropriate** indications in the ICU:

- Admission or transfer to the ICU
- Patient with clinical worsening
- Post-insertion of tube or catheter
- Post-chest tube removal

Example **Inappropriate** indications in the ICU:

- Stable patient without clinical change
- “ICU”
- “Chest”
- “Ventilated”
- “Daily CXR”
Results

- We were successfully able to reduce the percentage of inappropriate ICU chest radiograph indications from 64% to 36%.

- We found that giving face to face education to ordering clinicians and posting appropriateness criteria helped reduce inappropriate indications.

- Unfortunately, some of these gains were lost at the beginning of each new month due to influx of new residents that had not been educated. Once the new residents had received instruction, inappropriate indications began to trend downward once again.

- We address this problem in our sustainability section outlined below.
Results

Percent of ICU Chest Radiographs with Inappropriate Indications

- Direct observation of order placement: 64%
- 1st Face to Face Instruction
- ICU FLYER
- 2nd Face to Face Instruction
- Linear (PERCENT INAPPROPRIATE)
- Goal: 36%
<table>
<thead>
<tr>
<th>Activity to sustain</th>
<th>Owner</th>
<th>Sustain method and frequency</th>
<th>Report to</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU residents receive ordering guidelines during monthly on-boarding (1)</td>
<td>ICU fellows/Chief residents</td>
<td>During monthly changing of new residents in the ICU, the fellows and/or chiefs will brief them on ordering guidelines for ICU chest x-rays</td>
<td>ICU Fellow</td>
</tr>
<tr>
<td>Ensuring that the appropriate order indications are used to order chest x-rays from the ICU (1)</td>
<td>First year radiology resident on chest service</td>
<td>On the third Friday of the month the first year resident reviews indication for ICU chest x-rays and documents patients with inappropriate indications</td>
<td>Chest radiology section chief</td>
</tr>
<tr>
<td>Technologist confirm appropriate exam indication (2)</td>
<td>Tech Supervisor</td>
<td>Technologists will be educated on appropriate indications for a chest x-ray on an ICU patient.</td>
<td>Technologist manager</td>
</tr>
</tbody>
</table>

**Reliability Level ():**
(1) Individuals: Feedback, checklists, training, basic standards
(2) Procedures: Embedded standard work, reminders, constraints
(3) Systems/culture: Process redesign, built-in quality, automated systems, fail safes, physical structure, social norms, “mindfulness”
Key Learning Points

Overall learning points

1. Change doesn’t come easy, but it has to be worthwhile in order for it to happen
2. Not all changes are actual improvements
3. The importance of collaboration and effective communication
4. Always start with the problem, not the solution

Challenge:

- Obtaining accurate data
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