Reducing the number of changed orders for radiographs in a radiology department
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Methods

Interventions

• After analyzing baseline data, multiple interventions were identified
  • Delete unused orders from the electronic medical record
  • Outdated orders (i.e. Barium Enema)
  • Unused orders (i.e. Fluoro >1 hour)
  • Orders always changed per departmental protocol (i.e. 3-4 view radiograph of the pelvis)
  • Fix faulty order sets
  • Improve departmental and divisional preference lists
  • Remove orders that were either incorrect or rarely used for each division (i.e. 3-view hand radiograph for arthritis was removed from the emergency department preference list)
  • Group similar studies together (i.e. all upper extremity radiographs are in the same section)
  • Group different imaging studies of the same body part next to each other (i.e. one-view chest x-ray and two-view chest x-ray)
  • Rename orders to include the common indications for each imaging test (i.e. 1V abdomen – constipation)

• Improve paper order form for community providers
• Clarify departmental protocols
• 1 versus 2 view abdominal radiograph
• Imaging study to evaluate lower extremity PICC
• Pelvis radiograph versus 2-view hip radiograph

Results

• At baseline, 4.2% of all radiography and fluoroscopy were changed
• After multiple interventions, the percentage of changed radiography orders decreased to 3.1% (Figure 3)

Specific changes

• 4 orders were removed from the electronic medical record
• 4 orders in order sets were removed, 5 added, and 1 corrected
• 20 preference lists were modified (Figure 4)
• The paper order form (Figure 5) was modified and distributed

Conclusions

• Quality improvement techniques can be used to decrease the number of radiography orders changed in a radiology department
• We believe that the changes we have made help to make our department safer by decreasing the chance that an incorrect study will be performed

Problem

• Incorrect orders are a common occurrence in many radiology departments
• Potential order errors include:
  • Ordering the wrong test for the indication
  • Ordering a test on the wrong body part
  • Ordering a test on the wrong side of the body
• Order errors can lead to unnecessary studies and excess radiation
• In order to prevent errors, the technologist must verify each potential error with the ordering clinician

Specific Aim

• The goal of this project was to reduce the percentage of changed radiography and fluoroscopy orders from a baseline of 4.2% to 2.1%

Methods

Environment

• Large academic pediatric radiology practice
• All inpatient and ambulatory orders are placed in a hospital-wide electronic medical record system (Epic, Verona, WI)
• Community providers order imaging studies through a variety of paper and electronic methods

Baseline measurements

• A weekly report was created in the radiology information system (Epic Radiant, Verona, WI) identifying the procedure type and originating department of each changed order
• The percentage of changed orders per week was plotted on a P-chart and tracked as the primary outcome metric
• Pareto charts were created identifying the most frequently changed orders and the most common originating location for changed orders

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Figure 1: Pareto chart shows the percentage of changed orders per ordering department at baseline

Figure 2: Pareto chart shows the top ten most commonly changed radiography orders as well as the percentage of overall changes that these orders represent

Figure 3: Run chart showing the percentage of changed orders per week. There has been a significant decrease in the percentage of orders changed from a baseline median value of 4.2% to a current median of 3.1%