THE EFFECT OF EHR INTEGRATED RADIOLOGIST DRIVEN "ORDER CHANGE" PROCESS ON OUTPATIENT CT AND MRI EXAMINATIONS
To improve appropriateness and decrease medical imaging costs, Center for Medicare and Medicaid Services is launching Protecting Access to Medicare Act (PAMA) in January 2020.

PAMA mandates clinicians to select evidence-based imaging exams to decrease use of imaging when not clinically indicated.

In our department radiologists oversee CT and MRI exam orders and assign the parameters for technologists to follow for the exam based on indication & history. This process is referred to as “protocoling”.

• To facilitate engagement in patient care and leverage the expertise radiologists possess, our protocol page is embedded in the Electronic Health Record (EHR) and includes a “Change order needed” button, which flags exam orders that are deemed incorrect at the time of protocoling.
PURPOSE

• To assess the percentage of exam orders where an order change was requested.

• To assess the types of changes requested by radiologists.

• To assess the acceptance rate of the suggested changes by the ordering providers.
MATERIALS & METHODS

• IRB approved quality improvement study.

• Informed consent was waived.

• All outpatient CT and MRI imaging requests protocolled from 4/2017- 1/2018, where a change order request was submitted were analyzed.

• Total number of change order requests was calculated and the difference between the initial and new order for all accepted changes was categorized.

• Fisher exact test was utilized to assess for statistical significance (P<0.05).
WORKFLOW

• The change order requests submitted by radiologists populate a separate work-list managed by radiology clinical scheduling assistants (CSA). The CSAs initiate contact with the ordering provider and detail the change order request.

• If the provider agrees with the change, the CSA modifies the order for the provider and the provider can co-sign the order electronically.
  • A new order is requested for providers who do not have access to our EHR

• If the provider prefers not to change the order, it returns to the protocol list without change, with a note from the CSA.

• If a phone consult is requested by the ordering provider to discuss the case, the CSA facilitates transferring the provider into the relevant reading room.
In this case, radiologist believed CT exam WITH intravenous (IV) contrast is best test based on history of worsening abdominal pain and requested order change.
In this case, the exam indication was not correct per radiologist chart review. Lumbar MRI was suggested based on history of sudden onset low back pain and restricted range of motion.
RESULTS

• Change order requests submitted by radiologists were significantly higher for MRI (5.2%, 1,283/24,553) compared to CT (2.9%, 1,585/54,757), P<0.001.

• Ordering provider denial rate was equivalent for CT (18%, 230/1,283) and MRI (18%, 286/1,585).

• Change requests secondary to alteration in contrast utilization was the most common and was significantly different between CT (76%, 992/1,299) and MRI (65%, 688/1,053), P<0.001. Of these, most did not require a change in anatomical region imaged (92%, 912/992 for CT vs. 96%, 662/688 for MRI).
CHANGED ORDERS

Changed CT Orders
- Intravenous contrast was added or omitted: 8%
- Anatomy coverage was decreased or increased: 16%
- Exam type was changed*: 76%

Changed MRI Orders
- Intravenous contrast was added or omitted: 18%
- Anatomy coverage was decreased or increased: 17%
- Exam type was changed*: 65%

* Examples include CT/MR to CT/MR Angiography.
RESULTS

• Requests for different anatomical coverage only (without adjustment in contrast/exam type) were not significantly different between CT (16%, 206/1,299) and MRI (17%, 174/1,052).

• The most common change for CT maintained anatomical coverage but changed "with and without IV contrast" orders to "with IV contrast" only (35%, 460/1,299, P<0.001).

• The most frequent MRI change maintained anatomical coverage but changed "with and without IV contrast" studies to "without IV contrast" (25%, 259/1,052, p<0.001).
DISCUSSION

• Outpatient CT and MRI exams are deemed incorrect in 2.9% - 5% of cases after radiologist review.

• Radiologist review of orders is highly impactful and well received with 82% of requested order changes accepted by the ordering provider.

• Such a system appears more impactful than computerized decision support software, as a recent study showed 63% of “inappropriate studies” were still performed following an alert from computerized decision support software¹.

CONCLUSIONS

• Direct radiologist supervision of the CT and MRI exam orders improves patients’ care by optimizing contrast use for clinical indication and ensuring correct anatomical region is scanned.
  • While not specifically assessed in this study, the process may also help reduce radiation exposure and imaging costs.

• Integration of an EHR embedded protocoling interface and the change order process facilitates radiologist workflow and optimization of CT and MRI orders at the time of protocoling.
THANKS FOR YOUR ATTENTION

I would be happy to receive your questions:

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