

More Than 5.8 Million Potential Duplicative Imaging Orders Prevented in One Year, Saving Time and Money and Reducing Unnecessary Radiation Exposure

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Key Findings:

- In the span of one year, more than 5.8 million duplicate imaging orders were potentially prevented.
- Nearly 246,000 notifications were generated based on information about imaging studies performed outside of the ordering provider's own health care system.

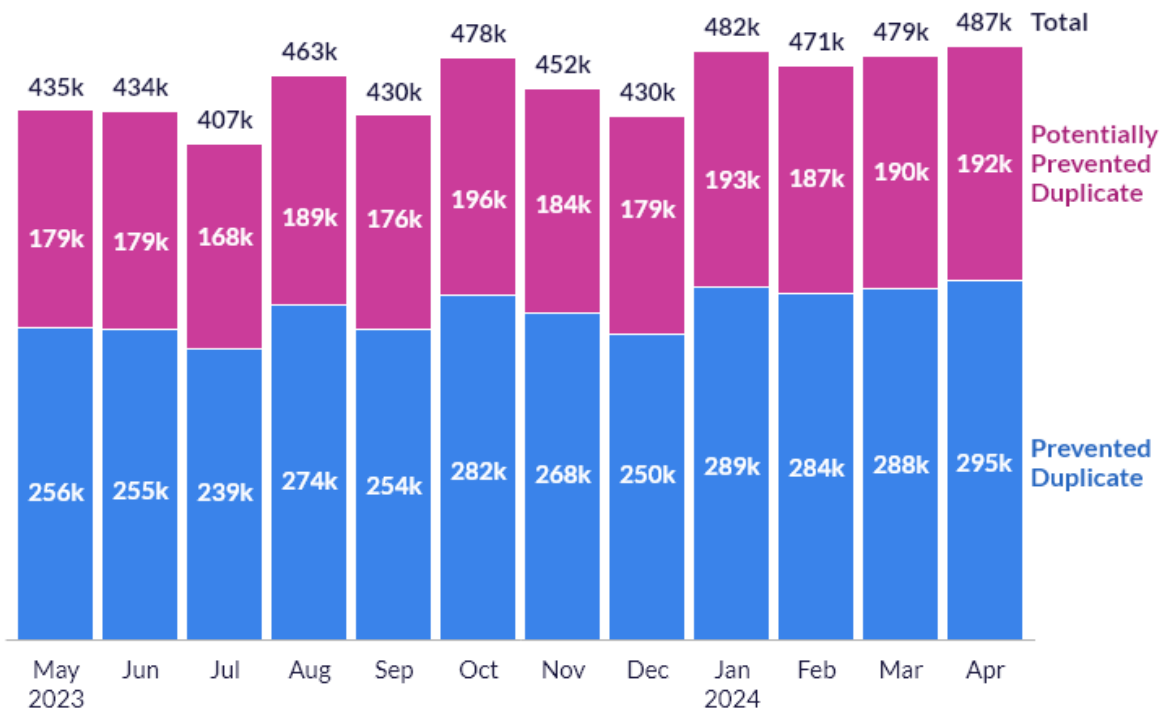
While imaging studies are an important part of providing care, unnecessary imaging studies are expensive, time-consuming, and can expose patients to risks such as radiation, intravenous contrast, or additional workup of incidental findings. One study found that imaging services accounted for 8% of total Medicare Part B expenditures, which equated to nearly \$64 billion in 2019.¹ Sharing health data through interoperability standards can improve efficiency and quality of care for patients who seek care in multiple systems.²

Providers using the Epic electronic health record (EHR) for documentation can be notified when they order an imaging study for which the patient already has a similar order or recent result. The provider can then choose whether it makes sense to continue to place the imaging order. This feature has been available for more than a decade for orders in the same instance of Epic, which can include other hospital or clinic locations within the same healthcare organization as well as independent hospitals or clinics who share an instance of Epic through the Community Connect program.

In 2021, Epic expanded this functionality to include duplicate order checking across external organizations with the release of Happy Together Imaging and Duplicate Checks Everywhere. This allows imaging orders sent from interoperable external systems to be evaluated as potential duplicate orders. As of November 2024, more than 3,000 hospitals and more than 774,000 physicians in the U.S. are connected through Epic's Care Everywhere interoperability framework.

To better understand how these duplicate imaging order notifications influenced provider behavior, we studied more than 32.4 million notifications presented over one year. A duplicate order is considered prevented if the provider cancelled or removed the duplicate order from the notification directly, while a potentially prevented duplicate describes when a provider navigates out of the ordering activity instead of placing the order. We found that each month between 400,000 and 500,000 orders were prevented or potentially prevented, as shown in Figure 1. If each of these imaging orders were a lower cost exam like a chest x-ray, this could equate to between \$310 million to \$523 million dollars in savings in just one year.³ If half of these orders were a more expensive exam, such as an MRI of the chest with contrast,⁴ this could equate to between \$1.5 billion and \$2.6 billion dollars in savings in one year.

Volume of Confirmed and Potentially Prevented Duplicates After Duplicate Notification



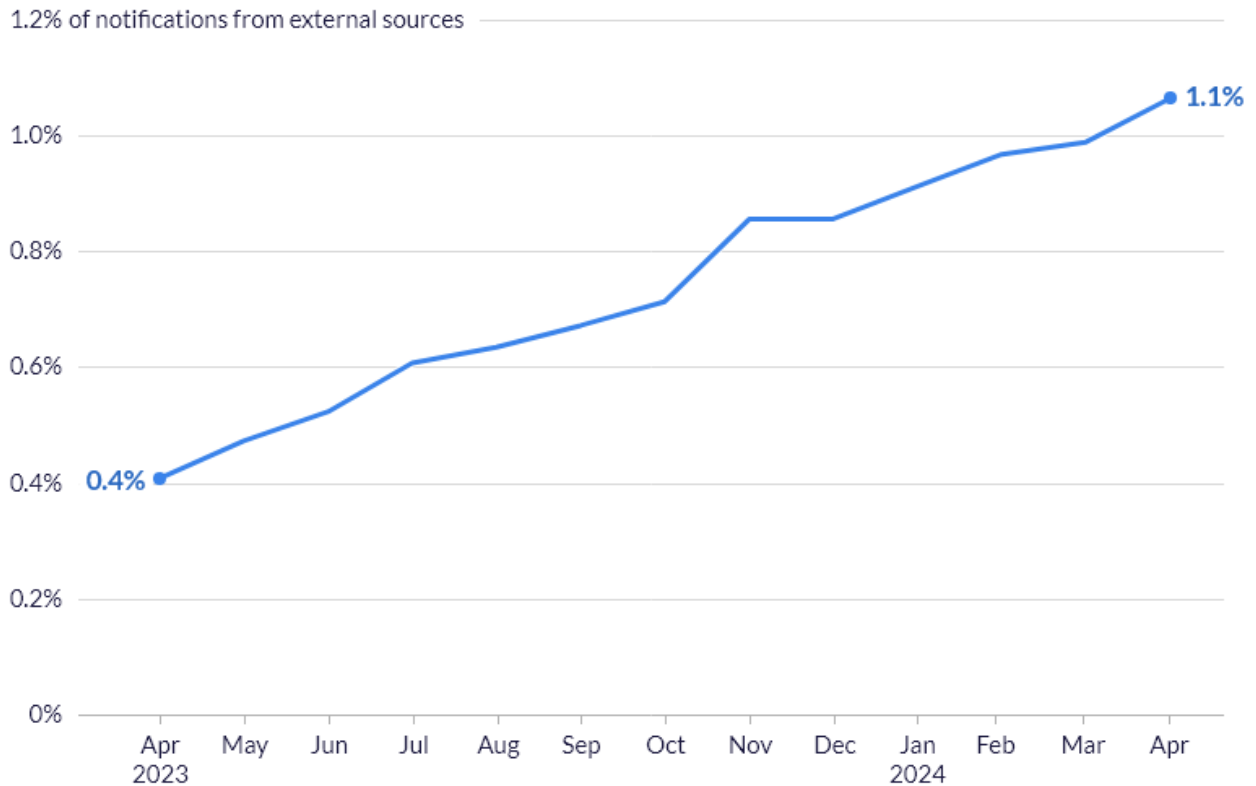
N=32,463,413 notifications

"Volume of Confirmed and Potentially Prevented Duplicates After Duplicate Notification," 2024. EpicResearch.org

Figure 1. Volume of notifications about potentially duplicate imaging orders by month stratified by whether the duplicate order was prevented or potentially prevented between April 2023 and April 2024.

As adoption of Happy Together Imaging and Duplicate Checks Everywhere increased, we saw duplicate checks triggered by external imaging exams increase from 0.4% of duplicate imaging notifications in April 2023 to 1.1% in April 2024, an increase of 160%, equating to nearly 246,000 notifications over the study period. This could represent between \$2.2 million and \$10.9 million of the potential annual savings noted for duplicate imaging order notifications.

Percentage of Duplicate Imaging Order Notifications from External Sources by Month



N=5,841,482 notifications "Percentage of Duplicate Imaging Order Notifications from External Sources by Month," 2024. EpicResearch.org

Figure 2. Percentage of duplicate imaging order notifications from data exchanged with an external organization by month between April 2023 and April 2024.

These data come from summarized metrics of organizations that use the Epic EHR and duplicate order checking. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. Kassavin MH, Parikh KD, Tirumani SH, Ramaiya NH. Trends in Medicare Part B Payments and Utilization for Imaging Services Between 2009 and 2019. *Curr Probl Diagn Radiol*. 2022;51(4):478-485. doi:10.1067/j.cpradiol.2021.08.002
2. Health Information and Management Systems Society. Interoperability in Healthcare. HIMSS. <https://www.himss.org/resources/interoperability-healthcare>. Accessed on July 19, 2024.
3. Medicare.gov. Radiologic examination, chest; 2 views: code: 71046. [Procedure Price Lookup for Outpatient Services | Medicare.gov 71046](#). Medicare. Accessed on November 20, 2024.
4. Medicare.gov. Magnetic resonance (eg, proton) imaging, chest (eg, for evaluation of hilar and mediastinal lymphadenopathy); with contrast material(s): code: 71551. [Procedure Price Lookup for Outpatient Services | Medicare.gov 71551](#). Accessed on November 20, 2024.

Data Definitions

Term	Definition
Study period	4/1/2023 – 4/30/2024
Study population	Imaging orders that triggered a duplicate imaging order notification during the study period for organizations with the functionality enabled. Organizations could define which imaging orders were included in duplicate checking.
Outcomes	Number of duplicate orders found for each of the following: <ul style="list-style-type: none"> Prevented: Discontinued existing order or removed duplicate that was being ordered Potentially prevented: Notification exited; next action unclear. Duplicate might or might not have been ordered in this case.
Potential Savings Calculations	\$96 total cost for chest x-ray. ³ \$841 total cost for MRI chest with contrast. ⁴ High value is ½ of tests chest x-ray, ½ of tests MRI.

Table 1. Volume of Confirmed and Potentially Prevented Duplicates After Duplicate Notification

Date	Prevented Duplicates	Potentially Prevented Duplicates
5/1/2023	255,517	178,997
6/1/2023	254,771	179,133
7/1/2023	238,693	167,911
8/1/2023	274,206	188,592
9/1/2023	254,058	176,097
10/1/2023	282,121	195,540
11/1/2023	267,712	184,013
12/1/2023	250,470	179,180
1/1/2024	289,252	193,173
2/1/2024	283,706	187,196
3/1/2024	288,229	190,397
4/1/2024	295,179	191,939

Table 2. Percentage of Duplicate Imaging Order Notifications from External Sources by Month

Date	Percentage of Notifications from External Source
4/1/2023	0.409%
5/1/2023	0.474%
6/1/2023	0.524%
7/1/2023	0.608%
8/1/2023	0.636%
9/1/2023	0.673%
10/1/2023	0.715%

11/1/2023	0.857%
12/1/2023	0.857%
1/1/2024	0.913%
2/1/2024	0.968%
3/1/2024	0.990%
4/1/2024	1.065%