Study of Duplicate CT Scans Show Promise of Health Information Exchange

Conservative estimate shows a potential savings of $1.3 million to Western New York's health system

Executive Summary

HEALTHeLINK works with health care providers throughout Western New York to help enhance patient outcomes and control costs through the utilization of a health information exchange (HIE). Through the HIE, providers can see what tests have been performed on their patients. This particular function of the HIE can help providers avoid ordering what may be potentially unnecessary duplicative tests, saving money and improving patient safety if the required test involves exposure to radiation.

HEALTHeLINK recently conducted an analysis utilizing clinical data available in its HIE to study the number of multiple computed tomography (CT) scans ordered for the same body part, for the same patient, over a six month timeframe. The analysis was done to put a qualitative value on how many potentially unnecessary duplicative tests are being ordered by providers in Western New York as well as potential cost savings to the health system.

The findings illustrate missed opportunities to both enhance patient safety and to reduce costs in the health systems, especially among providers who do not utilize HEALTHeLINK.

Among the highlights of HEALTHeLINK's analysis:

- During the 18-month study timeframe, approximately 2,763 CT scans were deemed to be potentially unnecessary duplicative tests.
- Approximately 90% of the potentially unnecessary duplicative CT scans were ordered by physicians who either never or infrequently used HEALTHeLINK.
- About 50% of the patients who had a duplicative CT scan had already consented to have their data accessed. Only 2.3% of the patients had denied consent.
- More than 95% of the identified potentially unnecessary CT scans were done in a hospital setting.
- The lost opportunity to utilize HEALTHeLINK before ordering a CT scan could have resulted in savings in the health system of approximately $1.3 million.

Process

The goal of this data analysis was to measure the impact of the use of HEALTHeLINK's patient query function which allows participating providers to securely and electronically access current health information about the patients they are treating through the HIE. CT scans were chosen due to their increasing usage within health care settings. In addition, CT scans also provide a radiation dosage potentially hundreds of times higher than a conventional x-ray. If an unnecessary duplicative CT scan was performed, the patient would have been exposed to unnecessary radiation.

The three major insurance carriers who represent approximately 65% of the commercially insured lives in Western New York – BlueCross BlueShield of Western New York, Independent Health and Univera Healthcare – provided CT scan claims data for the timeframe of July 1, 2011 through December 31, 2012. It should be noted that BlueCross BlueShield of Western New York, Independent Health and Univera Healthcare are also stakeholders in HEALTHeLINK.

The sample audience was comprised of patients who had received more than one CT scan within a six month period on the same part of the body. Scans were sorted into the three most common categories of current procedural terminology (CPT) groupings – head and neck, chest, and abdomen. CT scans that did not fall into these groupings were omitted for the purpose of this study.

Utilizing HEALTHeLINK and the patient query function (also known as the virtual health record or VHR), CT scans whose CPT codes were found to be in the same body part grouping were searched in the HIE. The first scan listed in the specified date range for each patient within the same CPT code grouping was considered to be the patient's "first scan" for purposes of this study.

In addition, HEALTHeLINK looked at the patient's consent status to determine if the patient provided authorization that enables physicians to access his/her medical records. HEALTHeLINK also was able to determine from the CT reports the name of the ordering physician of each radiology study. All of this information was reviewed by HEALTHeLINK through the HIE. If an exact match for a patient was not found within HEALTHeLINK, those CT scans were omitted from this study.

The next step was to look at each scan and filter out those which were deemed likely necessary. For example, if a CT scan had been ordered by the same physician on the same patient within a six month timeframe, it was assumed there must have been a reason to order this test again as the ordering physician would have had the results/ record of the first scan.

After omitting those tests ordered by the same physician, the remaining CT scans were scanned through HEALTHeLINK and reviewed for specific dates and keywords which determined if the ordering physician was aware of a previous scan on the same body part within the six month timeframe. These keywords included "comparison," indicating it was being compared to a previous study, "prior" or "previous."

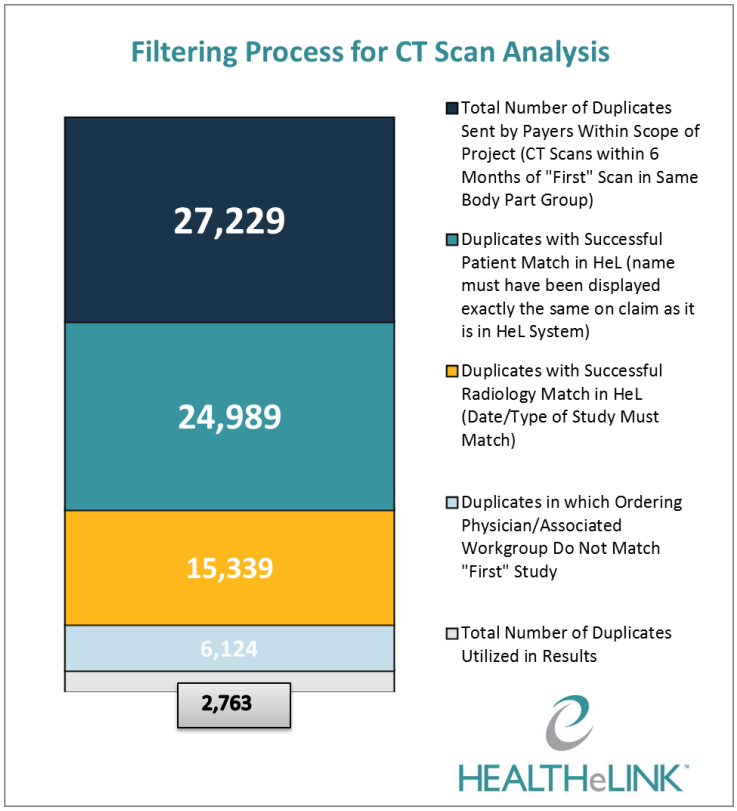
These duplicate scans were then divided into three separate categories:

- **Known studies** were studies in which the CT report clearly referenced a previous CT scan. The ordering physician was well aware of the last study and determined a follow up scan was necessary. A total of 3,361 CT scans that matched these criteria were removed from the overall study results.

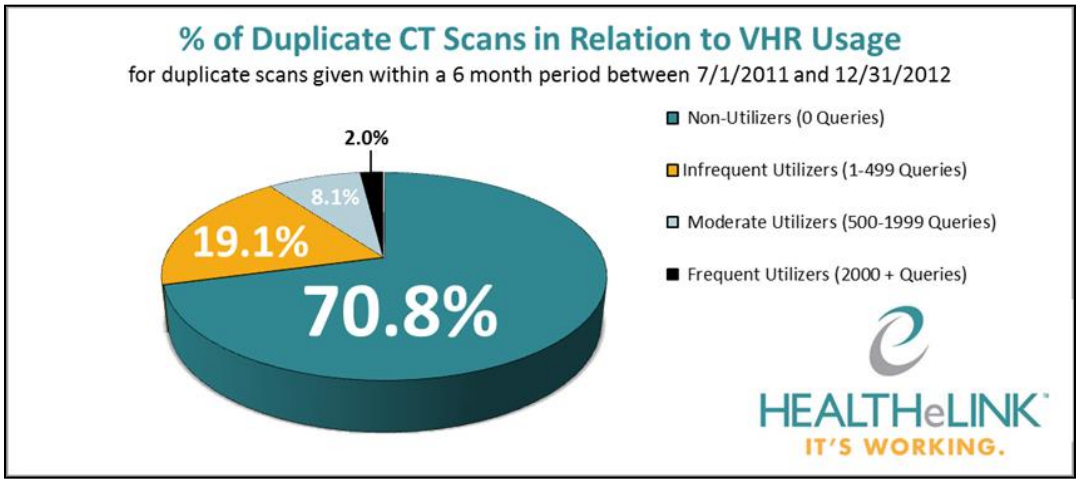
- **Inconclusive studies** were studies in which HEALTHeLINK was not able to determine if a previous study was known of prior to ordering the scan. Therefore the scan may or may not have been necessary. Since there is no indication of a previous scan, it is likely that the physician was not aware of the previous scan. A total of 1,878 CT scans were categorized as inconclusive and were included in the overall study results.

- **Unknown studies** were studies in which the CT report clearly states that no previous study is known of, or the previous study referenced is prior to the actual last known study available in HEALTHeLINK. A total of 885 CT scans fell into this category and were also utilized in the overall study results.

The following chart highlights the filtering process and final number of scans which were looked at for this analysis:

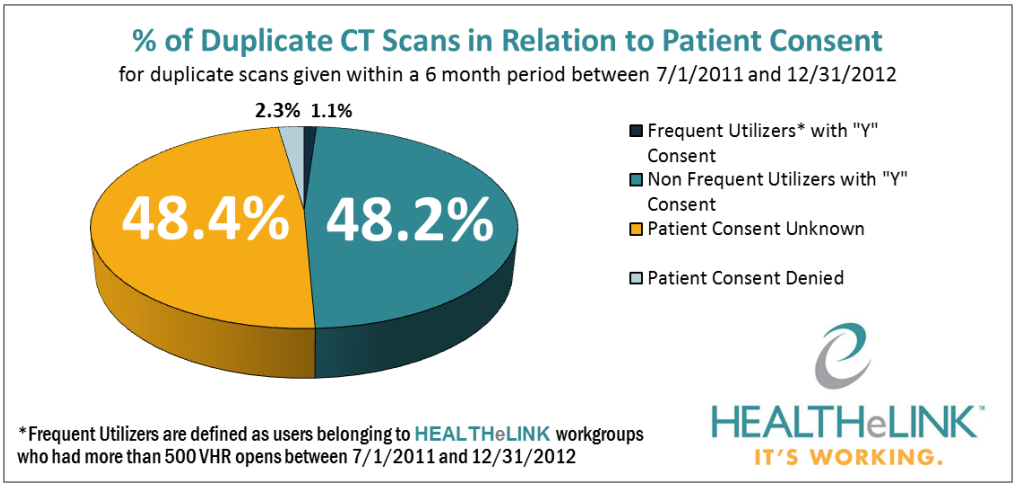


Results



The above graph indicates the percentage of duplicate CT scans in relation to patient queries or VHR usage by the ordering physician. The term “query” indicates every time the physician and/or practice conducted a patient query within HEALTHeLINK. Ordering physicians who were not HEALTHeLINK users from July 1, 2011 through December 31, 2012, are included in the “0 queries” group and are classified as non-users. In addition, this group also includes practices that may be HEALTHeLINK participants, but they did not conduct any patient queries during the 18 month timeframe.

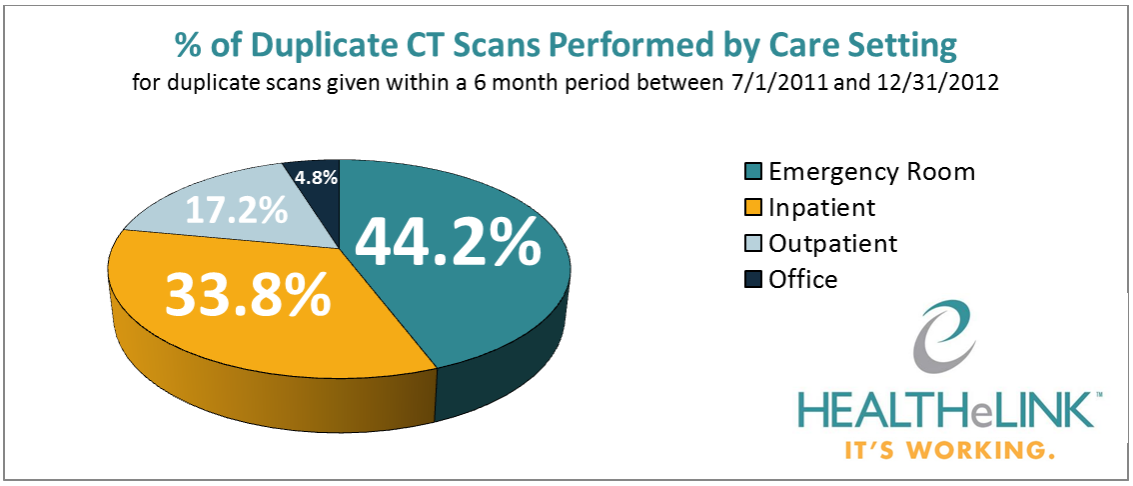
As the graph illustrates, approximately 90% of duplicate and potentially unnecessary CT scans were ordered by physicians who have little to no usage of the HIE when combining slices of users with less than 500 queries in 18 months. An opportunity therefore exists to reduce the number of duplicate CT scans if the physician is utilizing HEALTHeLINK to look up information and recent test results on their patients prior to ordering more tests. In addition, this also highlights a need to get more physicians participating and using the HIE in a meaningful way as more than 70% of duplicate CT scans were ordered by physicians who did not query HEALTHeLINK.



The above chart shows the relationship between duplicate CT scans and patient consent. In this analysis, 48.2% of the duplicate CT scans were performed on patients with a “yes” consent status. Had the ordering physician conducted a patient query through the HIE, he/she would have been aware a previous CT scan had been administered and able to view the results since the patient had already consented. Approximately 48.4% of the duplicate CT scans were performed on patients with an unknown consent status.

HEALTHeLINK’s history shows that, if asked, 95% of those individuals would have provided consent. Since this study only included CT scans posted to HEALTHeLINK, it is known that their information was available through patient query. Since the patient had not yet consented to share their health information on HEALTHeLINK, the treating physician would not have had access. Had their consent status been a “yes” the duplicate CT scan could have been potentially avoided. **These results indicate a lost opportunity for preventing a duplicate CT scan.** In more than 97% of the cases, if the treating physician had queried HEALTHeLINK then they would have already been authorized to view the results or they could have asked the patient about filling out a HEALTHeLINK consent form, enabling the results to viewed immediately.

HEALTHeLINK’s frequent utilizers – classified as providers with more than 2,000 patient queries over the study’s 18 month timeframe – accounted for only 1.1% of the duplicate CT scans, which reinforces proper HIE usage. Because they are frequent users, these practices have either already secured consent from their patients or are more likely to obtain consent from a patient with an unknown consent status. Conclusively, these frequent users are most likely running queries before ordering additional tests.



The above chart shows the setting in which each duplicate CT study was performed. Nearly half, 44.2%, of all duplicate studies were performed in an ER setting and in total 95.2% were performed in a hospital setting.

Conclusion

The data HEALTHeLINK analyzed for this study only accounted for duplicate CT scans of three specific body parts within an 18 month period. It demonstrates a lost opportunity as well as the potential and value of health information technology and health information exchange for providing patients with the most effective and efficient course of treatment. As CT scans subject patients to a higher radiation dosage, reducing duplicative tests would also reduce one's exposure to radiation.

It also appears that a substantial opportunity exists to help lower costs by eliminating unnecessary CT scans. Assuming an average cost of $500 per CT scan, these lost opportunities could have resulted in savings of more than $1.3 million to the Western New York health system. As this analysis took a clinically conservative look at CT scans for three specific body parts, additional savings could be achieved by reducing CT scans on other parts of the body as well as other high cost imaging such as MRIs.

If providers are enabled to use the HIE and patients provide physicians access through the consent process then duplicate tests, which are often unnecessary, are far less likely to be done. In the long run, this saves time, money and most importantly in the case of CT scans, eliminates unnecessary and potentially harmful radiation exposure to the patient.

About HEALTHeLINK

HEALTHeLINK, Western New York's clinical information exchange, is a collaboration among health care organizations within the eight counties of western New York State to share clinical information in efficient and meaningful ways to improve the delivery of care, enhance outcomes, improve patient health and help control health care costs. For more information about HEALTHeLINK, visit wnyhealthelink.com.