

Setting the Scene

MedQuest Associates, Inc.

- Multicenter, multistate outpatient imaging company
- Includes:

- Independent diagnostic testing facilities (IDTF)
- Hospital outpatient departments (HOPD)
- Quality and safety scorecard developed
- Part of overall company scorecard

Financial Vitality	Patient Satisfaction	Quality and Safety
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- Company held accountable to the scorecard

Analysis

- Time period: 2010-2015
- Five states in the company during the entire time period
 - Alabama, Florida, South Carolina, North Carolina, Virginia
- 35-44 centers each year
 - MR scanner(s): all centers
 - CT scanners: 28-36 centers each year
- Results run chart key:
 - MQ = company performance
 - High = highest of all center metrics
 - Low = lowest of all center metrics
 - Benchmark = metric benchmark

Crafting the Scorecard

Mapped the imaging workflow

- Identified key quality or safety points that address processes and outcomes

Developed metrics to measure those points

- Used variables that were:
 - Already available or easily developed
 - Measurable by computerized data inquiry
 - Able to be audited
- Preferred publicly reported metrics
- Set benchmarks for pass/fail score of metric
 - Some adjustment annually based on national averages or higher expectations

Developed the quality and safety scorecard

- A blend of multiple metrics
 - 7 metrics in 2010
 - 4 added in 2015 (followed them in 2014)
- Set scorecard scores
 - Threshold:** the number of metrics expected to be achieved 90% of the time (e.g. 7/11)
 - Target:** the number of metrics expected to be achieved 50% of the time (e.g. 9/11)
 - Maximum:** the number of metrics expected to be achieved 10% of the time (e.g. 10/11)
- Programs that were separate from the quality and safety scorecard:
 - Patient satisfaction
 - Physician peer review
 - Technologist evaluation

Patient-Provider Encounter



Right Exam?



% CT Abdomen With/Without

Measure	Operational Definition	Numerator	Denominator
% CT Abdomen With/Without	The percent of all CT abdomen patients (alone or with some other exam) who had a CT abdomen without/with examination	The number of CT abdomen without/with examinations (CPT codes: 74170, 74178) excluding patients with specified ICD-9/ICD-10 codes	The total number of CT abdomen patients (CPT codes: 74150, 74160, 74170, 74176, 74177, 74178) excluding patients with specified ICD-9/ICD-10 codes

% CT Chest With/Without

Measure	Operational Definition	Numerator	Denominator
% CT Chest With/Without	The percent of all CT chest patients (alone or with some other exam) who had a CT chest without/with examination	The number of CT chest patients without/with examination (CPT code 71270)	The total number of CT chest patients (CPT codes: 71250, 71260, 71270)

% CT Head with CT Sinus

Measure	Operational Definition	Numerator	Denominator
% CT Head with CT Sinus	The percent of all CT head patients who had a CT head and CT sinus exam on the same day	The number of patients with both a CT sinus (CPT codes: 70486, 70487, 70488) and a CT head (CPT codes: 70450, 70460, 70470) on the same day excluding patients with specified ICD-9/ICD-10 codes	The number of patients with a CT head (CPT codes: 70450, 70460, 70470) excluding patients with specified ICD-9/ICD-10 codes

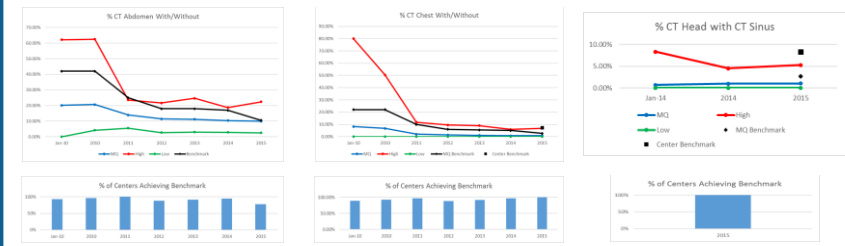
Why these?

- In many clinical situations, one CT, rather than two, gives:
 - No loss of clinical information
 - Half the radiation dose to the patient
- Definitions from Centers for Medicare & Medicaid Services (CMS) Hospital Outpatient Quality Reporting Imaging Efficiency Measures OP-10, OP-11, and OP-14 CMS Imaging Efficiency Measures: <http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPages%2FQnetTier2&cid=1228695266120>
- Benchmarks based on national averages as reported on Hospital Compare: <https://www.medicare.gov/hospitalcompare/search.html>

Interventions

- Marketing initiative towards referring providers to change ordering behaviors
- Reviewed indications with radiologists

Results



Machine Working?



CT Equipment Quality Assurance (QA)

Measure	Operational Definition	Numerator	Denominator
CT Equipment QA	The percent of centers which scanned in their CT Equipment QA Form each week.	The number of centers with at least one CT Equipment QA Form per week	The total number of centers with CT scanners

MR Equipment Quality Assurance (QA)

Measure	Operational Definition	Numerator	Denominator
MR Equipment QA	The percent of centers which scanned in their MR Equipment QA Form each week.	The number of centers with at least one MR Equipment QA Form per week	The total number of centers

Why these?

- MR and CT scanners should have daily and/or weekly QA for safety and for quality images

Interventions

- Completed CT and MR Equipment QA sheets with bar codes of the date and center name are scanned each week
- CT Equipment QA sheet modified for ACR Accreditation recommendations implemented in 2013
- E-mail to center manager on Friday afternoon if no CT and/or MR equipment QA form was scanned that week
- Currently implementing enterprise CT and MR equipment QA software

Results



High Risk Patient?



Glomerular Filtration Rate (GFR) Testing ≥ 60 Years Old

Measure	Operational Definition	Numerator	Denominator
GFR Testing ≥ 60 Years Old	The percent of IV contrast patients (MR and CT) ≥ 60 years old with the estimated GFR calculated on the Tech Module	The number of IV contrast patients ≥ 60 years old that had the estimated GFR calculated on the Tech Module	The total number of IV contrast patients ≥ 60 years old

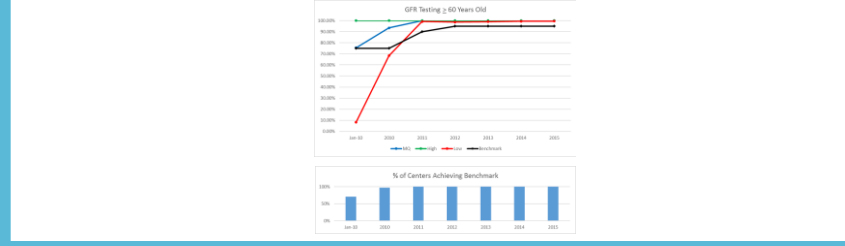
Why this?

- Patients with decreased renal function are at increased risk for contrast side effects
- In patients with decreased renal function, a smaller amount or no contrast is given
- Among the indications for pre-contrast renal screening, age is always known in outpatient imaging

Interventions

- Point-of-care serum creatinine analysis made available in each center
- Automatic GFR calculator was developed in the Tech Module
- In 2011, GFR became a required field for the Tech Module in contrast exam patients ≥ 60 years

Results



Exam Done Safely?



CT Head CT Dose ≤ 75 mGy

Measure	Operational Definition	Numerator	Denominator
CT Head Dose ≤ 75 mGy	The percent of CT head scans with CTDIvol ≤ 75 mGy; patients ≥ 18 years old; CPT codes: 70450, 70460, 70470	The number of CT head scans in adults with CTDIvol ≤ 75 mGy (if multiple passes, use the highest CTDIvol)	The total number of CT head scans in adults with a CTDIvol noted

CT Abdomen Dose ≤ 25 mGy

Measure	Operational Definition	Numerator	Denominator
CT Abdomen Dose ≤ 25 mGy	The percent of CT abdomen scans with CTDIvol ≤ 25 mGy; patients ≥ 18 years old; CPT codes: 74150, 74160, 74170, 74176, 74177, 74178	The number of CT abdomen scans in adults with CTDIvol ≤ 25 mGy (if multiple passes, use the highest CTDIvol)	The total number of CT abdomen scans in adults with a CTDIvol noted

Why these?

- Radiation exposure is becoming more important as more people are getting more CT scans
- CT head and CT abdomen have the only published reference radiation exposure values

Interventions

- Technologists copy the CT Dose Index_{volume} (CTDI_{volume}) from the scanner into a Tech Module field
- Radiologic Technologist Director evaluated CT protocols, as needed
- Equipment service engineers evaluated equipment service needs, as needed

Results



Ready for Emergencies?



Crash Cart Inventory

Measure	Operational Definition	Numerator	Denominator
Crash Cart Inventory	The percent of centers which scanned in their crash cart inventory each week	The number of centers with at least one crash cart inventory per week	The total number of centers

Contrast Reaction Drills

Measure	Operational Definition	Numerator	Denominator
Contrast Reaction Drills	The percent of centers who have performed at least two contrast reaction drills no closer than 90 days apart	The number of centers who scanned in 2 contrast reaction drill attendance lists, at least 90 days apart, in the calendar year	The total number of centers

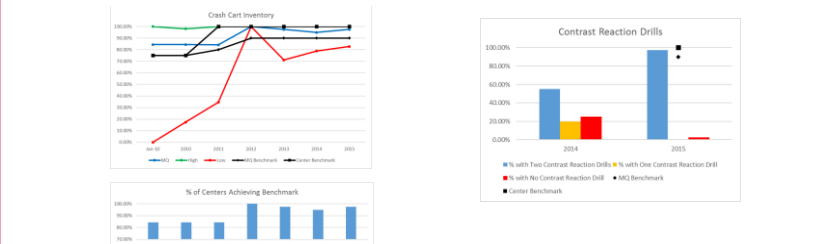
Why these?

- Serious contrast reactions and other serious medical conditions are rare in outpatient imaging
- Calling 911 is the back-up for emergency treatment in an freestanding center
- On-site medications should be current and technologists should be familiar with them
- A drill helps team members rehearse and prepare for rare but serious events.

Interventions

- Completed Crash Cart Inventory with bar codes of the date and center name are scanned each week
- Completion of the crash cart inventory is rotated throughout the center technologists
- E-mail to center manager on Friday afternoon if Crash Cart Inventory was scanned that week
- Completed Contrast Reaction Drill Attendance List with bar code of the date and center name is scanned after completion
- Reminders are sent encouraging the first contrast reaction drill before July and the second before December

Results



Exam Report Timely?



24-Hour Report Turnaround Time

Measure	Operational Definition	Numerator	Denominator
24-Hour Report Turnaround Time	The percent of reports that are delivered in less than 24 hours (the clock stops on weekends and holidays). Exclusions include statuses such as waiting for prior outside images.	The number of reports delivered in less than 24 hours	The total number of reports minus those excluded

Why this?

- Delivery of a timely report on a consistent basis is important for patient care

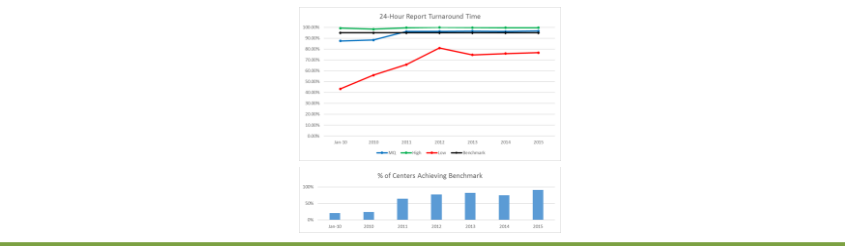
Interventions

- Benchmarks for intervals were set and are reported:
 - Exam to dictation (< 8 hours)
 - Dictation to transcription (< 6 hours)
 - Transcription to signature (< 4 hours)
- Monthly metric by center and by radiologist is distributed

Reporting Doctor	Number of Trackable Reports	Time from Examination Delivered to Deliverer			Delayed			Transmitted			Signed
		< 24 hours	24-48 hours	> 48 hours	< 8 hours	8-24 hours	> 24 hours	< 4 hours	4-24 hours	> 24 hours	
1001	655	768	92.84%	30	8.16%	424	64.73%	15	1.79%	318	37.06%
1002	285	285	99.89%	1	0.35%	19	6.64%	0	0.00%	13	18.53%
1003	765	767	99.99%	8	1.05%	104	13.54%	20	2.79%	185	17.79%
1004	302	301	99.89%	7	2.32%	107	35.53%	0	0.00%	20	13.24%
1005	1362	1367	99.93%	14	1.03%	136	10.04%	3	0.22%	127	9.30%

- No meaningful change in dictation/transcription software

Results



Moving the Needle

General interventions

- In addition to those for specific metrics
- Monthly e-mail of monthly and year-to-date metrics to the center managers and leadership team
- Ability to query lists of patient exams or instances of not meeting the benchmark
- Ability to view scanned forms
- Ability to identify which scanned forms are missing
- Leadership backing and attention

Conclusions

Quality and safety scorecard made a difference

- Most of the change occurred in the first two years
- The difference decreased over time between the centers with the highest and lowest metrics
- The change has been sustained
- Focus on the CMS Hospital Imaging Efficiency measures impacted the ordering behavior of the referral community