Accomodating Imaging Volume Under Health-care Reform

Introduction: Assuming that the Patient Protection and Affordable Care Act (PPACA) extends coverage to an additional 31 million formerly uninsured patients, we project a postreform increase in imaging volume of 13.6% in 2015.[1] The additional spending is quantified, under Medicare and Medicaid rates, using projected postreform imaging volume in six states (California, Florida, Massachusetts, New York, Tennessee, and Texas). Based on the existing providers established in those states and the number of CT and MRI systems installed in inpatient and outpatient settings there, some conclusions can be drawn about the capacity of equipment currently in place to absorb additional volume.

Methods: To project the ability of the currently installed equipment (in the six states under review) to accommodate the projected increases in imaging volume, we adapted the assumed equipment availability used by CMS: 50 hours per week. The practice-expense RBRVS formula assumes that equipment is in use 75% of those 50 hours (37.5 hours per week), but this analysis assumes 100% use (50 hours per week). Current capacity was measured against the additional volume to be generated by health reform.[1]

Applying an outpatient utilization/capacity calculation to a six-state installed base of MRI and CT units would not take into consideration the generally higher throughput characteristic of inpatient imaging. Therefore, using inpatient/outpatient-mix data from hospitals in the Regents customer base, an adjustment was made to the hospital MRI and CT installed capacity that reflects an 80% use assumption for MRI and a 60% use assumption for CT.

Equipment count: MRI capacity (Table 1) has been adjusted to eliminate MRI systems that have field strength of less than 1T and are therefore set to be phased out of use due to the inability to accredit them under the PPACA. This factor will have minimal impact in the hospital setting, but will be more significant in the outpatient setting, where 12% of all outpatient MRI systems in the six states under review have field strengths of less than 1T. The states with the most MRI systems with a field strength of less than 1T are California, Florida, and Texas.

Spending comparison: The increased number of insured patients is projected to result in an increase in revenue for imaging providers. The financial impact (using the generally lower Medicaid rates) would be additional spending of more than $1 billion for MRI and CT exams in California alone. If all imaging growth projected in these six states materializes, the additional volume paid for under the lower Medicaid rates would increase spending more than $3.3 billion. California leads the six states in anticipated increased spending for imaging under the PPACA, followed by Texas and Florida.

Unknown elements under health reform include the level of reimbursement. Will reimbursement conform to Medicare or Medicaid rates? The last column of Table 2 averages the sums under the generally higher Medicare Physician Fee Schedule rates with the sums calculated under the generally lower Medicaid reimbursement rates.

Capacity: While the absolute numbers in the columns for current need and current capacity in Table 3 would indicate an inability to provide access to MRI and CT in, for example, Tennessee and Florida, we understand that this is not the case. The more relevant number to observe is the net change needed in capacity. New York, California, and Texas might need to add technology, while Florida's installed CT base would indicate the ability to meet future need.

Equipment totals for the states focus on the current number of MRI and CT units in each state, encompassing hospitals and outpatient locations and including nonradiologist physicians' practices. The count of MRI units with field strengths of less than 1T was subtracted from the state totals.

Capacity caveat: Using the Medicare measurement for equipment availability and use creates anomalies at a macromeasurement level. First, outpatient data include emergency-department utilization. Hospital emergency departments are commonly available and used 24/7. This results in the current and postreform capacities being overstated. Some locations also might operate more than 50 hours per week.

Second, capacity is a result of the number of units, the hours that a machine is available for use, and total exam time needed. A capacity that is more than 100% is a result of applying the Medicare standard for machine availability of 50 hours per week at 100%. Third, the Regents standards for capacity calculations dictate an appropriate measure of 80%. This measure allows for schedule flexibility and emergency add-on procedures, when required. Once 80% utilization is consistently reached, capacity must be increased in order to maintain timely patient access.

Table 1. CT and MRI Systems in Six States

State	Population	Hospital CT systems	Hospital MRI systems	Hospital MRI systems of < 1T	Outpatient CT systems	Outpatient MRI systems	Outpatient MRI systems of < 1T
California	36,899,700	341	274	11	383	536	78
Florida	18,413,600	477	236	4	749	620	69
Massachusetts	6,613,100	116	99	4	60	80	3
New York	19,221,100	252	144	2	392	477	30
Tennessee	6,243,900	248	142	7	134	105	11
Texas	24,840,100	453	285	6	494	541	88

Reference

1. Forecasting imaging use under health-care reform. *Radiology Business Journal*. 2012;5(2):19-20.

Table 2. Projected Postreform Revenue Increases

	Volume increase	Revenue increase under Medicare	Revenue increase under Medicaid	Average of Medicare and Medicaid revenue increases
CALIFORNIA				
CT	782,942	$517,140,840	$347,609,883	$432,375,361
MRI	645,183	$851,588,912	$756,377,707	$803,983,310
Total, MR and CT	1,428,125	$1,368,729,752	$1,103,987,590	$1,236,358,671
Other	7,543,913	$1,450,685,379	$1,030,860,686	$1,240,773,032
Total, all imaging	8,972,038	$2,819,415,131	$2,134,848,276	$2,477,131,703
FLORIDA				
CT	567,430	$171,160,809	$95,294,569	$133,227,689
MRI	438,321	$260,068,211	$144,666,975	$202,367,593
Total, MRI and CT	1,005,751	$431,229,020	$239,961,545	$335,595,282
Other	5,060,528	$462,620,615	$173,340,558	$317,980,586
Total, all imaging	6,066,279	$893,849,635	$413,302,102	$653,575,868
MASSACHUSETTS				
CT	43,305	$14,847,995	$9,946,516	$12,397,256
MRI	20,983	$14,375,385	$9,725,107	$12,050,246
Total, MRI and CT	64,288	$29,223,381	$19,671,623	$24,447,502
Other	313,769	$29,006,153	$15,815,371	$22,410,762
Total, all imaging	378,057	$58,229,534	$35,486,994	$46,858,264
NEW YORK				
CT	398,820	$137,754,736	$74,086,746	$105,920,741
MRI	249,650	$172,010,187	$95,331,325	$133,670,756
Total, MRI and CT	648,470	$309,764,923	$169,418,071	$239,591,497
Other	3,732,946	$409,577,866	$185,422,119	$297,499,993
Total, all imaging	4,381,416	$719,342,789	$354,840,191	$537,091,490
TENNESSEE				
CT	131,740	$25,263,703	$20,210,874	$22,737,288
MRI	68,374	$24,581,137	$19,664,902	$22,123,019
Total, MRI and CT	200,114	$49,844,840	$39,875,776	$44,860,308
Other	979,837	$41,318,290	$33,054,905	$37,186,598
Total, all imaging	1,179,951	$91,163,130	$72,930,681	$82,046,905
TEXAS				
CT	716,778	$200,266,824	$136,120,621	$168,193,723
MRI	490,263	$271,916,160	$176,302,636	$224,109,398
Total, MRI and CT	1,207,041	$472,182,985	$312,423,257	$392,303,121
Other	6,148,984	$467,467,127	$375,923,980	$421,695,554
Total, all imaging	7,356,025	$939,650,112	$688,347,237	$813,998,674
TOTAL, MRI AND CT	4,553,789	$2,660,974,899	$1,885,337,861	$2,273,156,380
TOTAL, ALL IMAGING	23,952,350	$4,802,307,540	$3,344,915,290	$4,073,611,415

Table 3. Current and Postreform CT and MRI Needs and Capacities

	Current need	Current capacity	Projected need	Projected capacity	Change
CALIFORNIA					
CT	635	108%	735	125%	17%
MRI	1,004	133%	1,190	178%	45%
FLORIDA					
CT	491	47%	563	54%	7%
MRI	681	84%	808	110%	25%
MASSACHUSETTS					
CT	161	124%	166	128%	4%
MRI	153	96%	159	104%	8%
NEW YORK					
CT	456	84%	507	93%	9%
MRI	545	92%	617	110%	18%
TENNESSEE					
CT	148	52%	165	58%	6%
MRI	147	67%	167	83%	15%
TEXAS					
CT	435	57%	527	69%	12%
MRI	580	75%	721	107%	31%

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