

# National Estimates of Price Variation by Site of Care

Aparna Higgins, MA; German Veselovskiy, MPP; and Jill Schinkel, MS

**T**he role of healthcare prices as a key factor in driving total health spending in the United States, compared with other developed countries, is well documented.<sup>1,3</sup> Characterizing variability in prices for different healthcare services, and that variability's impact on total spending, has been of interest to researchers and policy makers. However, most research to date has focused on geographic variation in prices for specific healthcare services within the United States. These studies have found wide hospital-level and regional variation in prices for specific healthcare services, such as vaginal births and knee and hip replacements.<sup>4,5</sup>

More recently, the focus has turned to characterizing price variations for the same healthcare service by site of care, (eg, hospital outpatient department [HOPD] and physician office [PO]). The Medicare Payment Advisory Commission (MedPAC) recently analyzed payments for services rendered in HOPDs compared with payments for the same services performed in independent physician practices. For example, for patients with similar risks and characteristics, payments in HOPD exceeded payments in PO by 19% for level II cardiac imaging, and by 141% for a level II echocardiogram.<sup>9</sup>

Evidence of price differences across sites of care in the commercially insured population is limited; previous analysis has focused on either a single year of data or specific subpopulations. Analysis of commercial claims data from 2005 for 16 groups of services found the average HOPD-to-PO price ratio was 3.5.<sup>10</sup> Based on data from 4 health plans, a 34% price differential was found between HOPDs and POs for cancer episodes with the same set of services in an episode, after adjusting for patient severity.<sup>11</sup>

A more recent analysis of prices for 9 healthcare services, based on insurance claims for a subpopulation of active and retired autoworkers and their dependents, found a 4-fold variation in prices by site of care, with HOPD prices being consistently higher than those of POs.<sup>12</sup> Similarly, researchers assessing the impact of Medicare fee cuts on integration

## ABSTRACT

**Objectives:** Recently, researchers and policy makers have demonstrated growing interest in differences in payments across sites of care for the same healthcare service, such as in a hospital outpatient department (HOPD) versus a physician office (PO). Our objective was to examine the price differential for individuals with employer-sponsored insurance by site of care for 7 commonly performed services at the national and regional level.

**Study Design:** We analyzed 2008 to 2013 claims data from Truven Health MarketScan Commercial Claims and Encounters Database, containing administrative data for 44 to 53 million individuals covered by employer-sponsored health insurance.

**Methods:** We selected 7 services based on total payments from different clinical categories—categories in which differences in clinical quality and patient morbidity are less likely to be sources of the price differential. We calculated payment amounts at the visit level for each healthcare service by site of care, then calculated the price differential by site of care as a ratio of average HOPD price to the average PO price or average ambulatory surgery center price for the same service.

**Results:** Across all 7 services, prices at a HOPD were statistically significantly higher than payments to a PO, ranging in 2013 from 21% more for an office visit to 258% more for chest radiography. The increase in the price differentials, combined with a shift in volume in favor of hospital outpatient departments, was associated with a 44% increase in total spending between 2008 and 2013.

**Conclusions:** Our study shows that price differentials by site of care exist at a national level, and that they are increasing over time.

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of cardiologists with hospitals found differences in prices by site of care for select cardiology-related services.<sup>13</sup> We are unaware of studies to date that have focused on national estimates of price differences by site of care and the implications of these differences for total US healthcare spending.

The objectives of our study were to: a) develop national estimates of price differences by site of care for select services, b) examine temporal trends in such price differences, and c) analyze implications for price differences on total and consumer out-of-pocket (OOP) spending.

## METHODS

We identified the top 100 Current Procedural Terminology (CPT) codes—the code set of medical procedures and services maintained by the American Medical Association—for calendar year 2011, then classified them into broad clinical categories, such as office visits, imaging services, outpatient procedures, laboratory services, etc.

We used the following set of criteria to select 7 services for our study: a) representation from different clinical categories, b) services with the highest total payments within a clinical category, c) sufficient volume of visits for the service by site of care to enable reliable comparisons of price differential (at least 20,000 visits at each site of care), and d) services in which differences in clinical quality and patient morbidity are less likely to be the source of the price differential. Based on these criteria, we selected CPT codes from the clinical categories of office visits, imaging services, and outpatient procedures. Specifically, we chose CPT codes 99213 (office visit, established patient, 15 minutes) and 99215 (office visit, established patient, 40 minutes) for office visits; 70450 (computed tomography [CT] scan), 72148 (magnetic resonance imaging [MRI]), and 71020 (chest radiography) for imaging services; and, for procedures, 43239 (upper gastrointestinal endoscopy) and 45378 (colonoscopy).

### Definitions

We defined a healthcare service as synonymous with a CPT code. A visit is defined as a provision of a healthcare service on a specific date. We calculated payment amounts at the visit level for each healthcare service by site of care and included both the facility and professional payments where applicable (eg, imaging services). The total payment included the portion paid by the insurer and the consumer OOP payment (ie, the allowed amount for the visit at a particular site of care). This allowed amount was defined

### Take-Away Points

Our analysis showed that for individuals with employer-sponsored insurance, prices for services performed at hospital outpatient departments were higher than prices for the same services at other care settings (ie, physician offices and/or ambulatory surgical centers).

- Across all 7 commonly performed services analyzed, prices at hospital outpatient departments were higher than prices at physician offices; they ranged from 21% more for an office visit to 258% more for chest radiography in 2013.
- The magnitude of price differential increased over the study time period (2008-2013).
- The increase in the price differential for the 7 services, combined with a shift in volume in favor of hospital outpatient departments, was associated with a 44% increase in total spending between 2008 and 2013.

as the price per visit. We defined the price differential by site of care to be the ratio of average HOPD price for a service to the average price of that same service in a PO or an ambulatory surgery center (ASC), as applicable.

### Visit Inclusion and Exclusion Criteria

To ensure comparability of visits across the different sites of care, we used the following criteria for inclusion based on claims for these visits: a) visits paid in-network and on a fee-for-service basis; b) for imaging services and outpatient procedures, only visits with both technical and professional claims; and c) visits for endoscopy and colonoscopy in which these were the only procedures performed during the visit. To minimize the effect of outlier payments on price differential, we excluded visits using the interquartile range method for outliers.

### Data Source

The data source is the Truven Health MarketScan Commercial Claims and Encounters Database, 2008 to 2013. The Market Scan data contain administrative data for 44 to 53 million individuals (depending on the study year) covered by employer-sponsored health insurance. We used the annual enrollment file and outpatient services file, which include information on coverage dates, service dates, age, sex, total dollars paid to providers, procedure codes, procedure modifier codes, and the place of service where the procedure was performed.

### Statistical Analysis

We calculated the average price at the visit level for each of the 7 services by site of care and by year, and we used weights derived from the Household Component of the Medical Expenditure Panel Survey and provided by Truven Health Analytics to generate national estimates of price differentials. For procedures, we calculated Charlson comorbidity index (CCI) scores to assess morbidity of patients by site of care.<sup>14</sup> Specifically, we compared aver-

**Table 1. Price Differential for Office Visits, Imaging, and Procedures (2008-2013)<sup>a</sup>**

CPT Code (description)	2008	2009	2010	2011	2012	2013
99213 (office/outpatient visit, est, 15 minutes)						
Payment ratio: HOPD to PO	1.14	1.14	1.16	1.18	1.21	1.21
Mean payment (PO)	\$64	\$66	\$68	\$71	\$73	\$73
99215 (office/outpatient visit, est, 40 minutes)						
Payment ratio: HOPD to PO	1.12	1.18	1.23	1.22	1.24	1.25
Mean payment (PO)	\$131	\$134	\$136	\$141	\$144	\$146
70450 (CT scan of head/brain w/o dye)						
Payment ratio: HOPD to PO	2.54	2.72	2.72	2.69	2.82	2.52
Mean payment (PO)	\$268	\$275	\$279	\$279	\$273	\$273
72148 (MRI lumbar spine w/o dye)						
Payment ratio: HOPD to PO	1.99	2.12	2.22	2.27	2.35	2.31
Mean payment (PO)	\$583	\$582	\$570	\$573	\$567	\$557
71020 (chest x-ray)						
Payment ratio: HOPD to PO	2.97	3.23	3.49	3.59	3.74	3.58
Mean payment (PO)	\$42	\$42	\$41	\$42	\$41	\$42
43239 (upper gastrointestinal endoscopy)						
Payment ratio: HOPD to PO	2.82	2.68	2.81	2.76	2.92	3.43
Mean payment (PO)	\$407	\$451	\$437	\$456	\$459	\$438
Payment ratio: HOPD to ASC	1.60	1.69	1.54	1.52	1.58	1.74
45378 (colonoscopy)						
Payment ratio: HOPD to PO	2.47	2.37	2.35	2.95	2.41	2.71
Mean payment (PO)	\$526	\$578	\$580	\$454	\$627	\$607
Payment ratio: HOPD to ASC	1.52	1.62	1.49	1.57	1.61	1.69

ASC indicates ambulatory surgical center; CPT, Current Procedural Terminology; CT, computed tomography; est, established patient; HOPD, hospital outpatient department; MRI, magnetic resonance imaging; PO, physician office; w/o, without.  
<sup>a</sup>All price differentials by site of care displayed in the table are statistically significant at the level of  $P < .001$ .  
 Source: Authors' analysis of Truven Health MarketScan Commercial Claims and Encounters Database, 2008-2013.

the average price paid for this service in an HOPD and the average price paid for the same service in a PO. We then summed these amounts across all 7 services to arrive at the total national additional spending due to price differential by site of care.

## RESULTS

### Comparisons of Price Differential at the Service Level

Table 1 shows the ratio of average HOPD price to average PO price for office visits and imaging services, and additionally, for the colonoscopies and endoscopies, the ratio of average HOPD price to average ASC price. Between 2008 and 2013, and across all services, HOPD prices were statistically significantly different ( $P < .001$ ) and higher than prices at PO or ASC (where applicable).

The site-of-care price differential for imaging and procedures was substantially higher when compared with office visits. Average HOPD prices were 2 to 3 times more than average prices at PO for the same service. For procedures, these observed differences do not appear to be caused by differences in patient morbidity by site of care. Patient morbidity rates, as measured by the CCI, were similar across sites of care across all years in our study sample, and higher HOPD to PO and ASC pricing was observed among patients

with similar CCI scores (see eAppendix 1 for CCI data for 2013 [eAppendices available at [www.ajmc.com](http://www.ajmc.com)]). Distribution of patients' gender and age were also similar for the analyzed services across different sites of care (see eAppendix 2 for the 2013 data).

age CCI scores for patients, as well as percent of patients with CCI scores of 0, 1, and >1, by site of care. Similar to researchers at MedPAC, we did not risk adjust payments for office visits and imaging services, because patient morbidity is less likely to be an issue for these services.<sup>9</sup> We also conducted statistical tests of significance using the 2-sample *t* test to assess the probability that differences in the average price by site of care are random. To examine trends in price differentials, we calculated an index of the price differential for each clinical category: office visits, imaging services, and outpatient procedures. The index was derived using as weights the proportion of visits for each service by site of care.

Finally, to calculate additional spending due to price differential for each service, we multiplied the number of visits occurring in an HOPD by the difference between

with similar CCI scores (see eAppendix 1 for CCI data for 2013 [eAppendices available at [www.ajmc.com](http://www.ajmc.com)]). Distribution of patients' gender and age were also similar for the analyzed services across different sites of care (see eAppendix 2 for the 2013 data).

### Trends in Price Differential and Volume of Services by Site of Care (2008-2013)

We found that price differential by site of care increased over time. The Figure shows temporal trends in the index of price differential by clinical category. Between 2008 and 2013, the price differential index increased by 10% for office visits, 15% for procedures, and 17% for imaging services. Within each clinical category, the price differential for some services increased at a faster rate than others. For example, the price differential of chest radiography

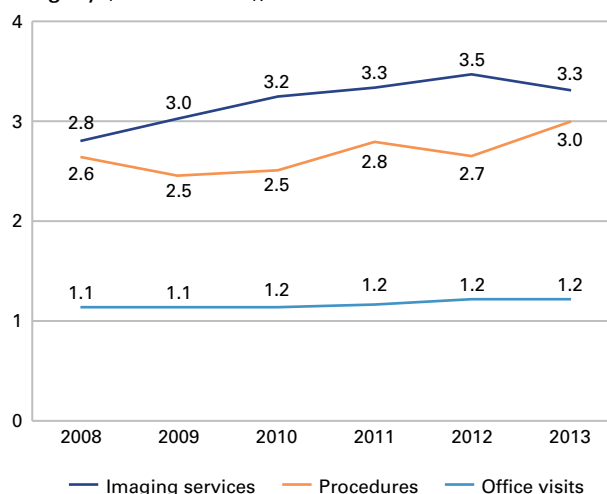
increased by 20% from 2008 to 2013, while the price differential for CT scan of head remained largely unchanged (decrease of less than 1%).

In addition to examining temporal trends in the price differential by site of care, we also analyzed changes in the proportion of visits occurring at each site of care between the years 2008 and 2013. In all years, the vast majority of office visits occurred in a PO. We did, however, observe a shift in the volume of services for CPT code 99215 (office visit, established patient, 40 minutes) in favor of hospital outpatient departments, from 5% of visits in 2008 to 8% in 2013 (Table 2). All imaging services also showed a volume shift from a PO to an HOPD between 2008 and 2013. This shift was most pronounced for MRI, where the proportion of visits in HOPDs increased from 32% in 2008 to 37% in 2013.

### Price Differential and Out-of-Pocket Spending

Table 3 shows the differential in 2013 average individual OOP spending for a service received at an HOPD versus a

■ **Figure.** Ratio of Price Differential Index by Clinical Category (HOPD to PO), 2008-2013



HOPD indicates hospital outpatient department; PO, physician office. Source: Authors' analysis of Truven Health MarketScan Commercial Claims and Encounters Database, 2008-2013.

■ **Table 2.** Number and Proportion of Visits by Site of Care (2008-2013)

Category	CPT Code	Statistic	2008	2009	2010	2011	2012	2013
Office Visits	99213 (office/outpatient visit, est, 15 minutes)	Visits, n	151,680,000	157,820,000	161,330,000	147,410,000	157,060,000	176,840,000
		% in PO	98%	98%	98%	98%	98%	97%
		% in HOPD	2%	2%	2%	2%	2%	3%
	99215 (office/outpatient visit, est, 40 minutes)	Visits, n	8,581,835	8,761,457	9,398,968	8,550,513	9,031,678	9,713,942
		% in PO	95%	94%	94%	93%	92%	92%
		% in HOPD	5%	6%	6%	7%	8%	8%
Imaging	70450 (CT scan of head/brain w/o dye)	Visits, n	827,317	936,866	722,644	885,229	940,961	784,018
		% in PO	17%	16%	19%	14%	13%	16%
		% in HOPD	83%	84%	81%	86%	87%	84%
	72148 (MRI lumbar spine w/o dye)	Visits, n	1,043,295	1,062,585	1,006,143	1,043,030	1,118,543	1,185,634
		% in PO	68%	66%	69%	63%	61%	63%
		% in HOPD	32%	34%	31%	37%	39%	37%
71020 (chest radiography)	Visits, n	7,330,534	7,692,462	6,600,240	6,742,045	7,115,065	6,852,729	
	% in PO	56%	55%	61%	54%	52%	55%	
	% in HOPD	44%	45%	39%	46%	48%	45%	
Procedures	43239 (upper gastrointestinal endoscopy)	Visits, n	534,450	576,689	530,919	638,776	731,172	915,822
		% in PO	19%	14%	23%	17%	13%	14%
		% in HOPD	57%	62%	55%	62%	60%	50%
	45378 (colonoscopy)	% in ASC	24%	25%	21%	21%	27%	37%
		Visits, n	759,332	774,341	662,779	752,841	805,128	925,584
		% in PO	15%	12%	21%	15%	12%	13%
% in HOPD	58%	61%	54%	61%	56%	47%		
% in ASC	27%	27%	25%	24%	32%	41%		

ASC indicates ambulatory surgical center; CPT, Current Procedural Terminology; CT, computed tomography; est, established patient; HOPD, hospital outpatient department; MRI, magnetic resonance imaging; PO, physician office; w/o, without. The numbers may not add up to 100% due to rounding. Source: Authors' analysis of Truven Health MarketScan Commercial Claims and Encounters Database, 2008-2013.

**Table 3. Hospital Outpatient Department to Physician Office Out-of-Pocket Payment Ratios by CPT Code, 2013**

CPT Code	Ratio of OOP Expenses: HOPD to PO
99213 (office/outpatient visit, est, 15 minutes)	1.06
99215 (office/outpatient visit, est, 40 minutes)	1.16
71020 (chest x-ray 2-view frontal and lateral)	2.66
70450 (CT scan of head/brain w/o dye)	1.55
72148 (MRI lumbar spine w/o dye)	1.86
43239 (upper gastrointestinal endoscopy including esophagus, stomach, and either the duodenum and/or jejunum as appropriate; with biopsy, single or multiple)	2.94
45378 (colonoscopy, flexible, proximal to splenic flexure; diagnostic, with or without collection of specimen[s] by brushing or washing, with or without colon decompression [separate procedure])	2.80

ASC indicates ambulatory surgical center; CPT, Current Procedural Terminology; CT, computed tomography; est, established patient; HOPD, hospital outpatient department; MRI, magnetic resonance imaging; OOP, out-of-pocket; PO, physician's office; w/o, without. Source: Authors' analysis of Truven Health MarketScan Commercial Claims and Encounters Database, 2013.

PO. Across product types, such as health maintenance organization, preferred provider organization, or consumer-directed health plan, on average, an individual receiving care in an HOPD paid between 1.06 and 2.94 times what they would have paid in a PO for that same service.

### National Estimates of Additional Spending Due to Price Differential

We found that the price differential between HOPD and PO was associated with \$1.3 billion more in health-care spending for all 7 services in 2008 (adjusted to 2013 dollars using the healthcare consumer price index) and \$1.9 billion in 2013—a 44% increase in total spending.

## DISCUSSION

Our study shows that price differentials by site of care exist at a national level, and that they are increasing over time. The amount of price differential varies by type of service, with the greatest differential occurring for imaging visits and procedures. Price differentials for some imaging procedures, such as chest radiography and MRI, are increasing at a faster rate than other services, such as office visits. This increase in differential was accompanied by shifts in volume of services from POs to HOPDs.

Our findings are consistent with previous research that showed HOPDs typically get paid more for services compared with other settings (PO and/or ASC) by both private insurers and Medicare.<sup>9,10,12</sup> For example, the HOPD-to-PO payment ratio for a colonoscopy in 2011 was 2.06 among

privately insured active and retired non-elderly autoworkers and their dependents compared with 2.84 in our study.<sup>12</sup>

Although our study did not focus on the reasons for a site-specific price differential, previous research offers some clues. Increases in site-of-care price differential over time may be related to vertical integration, which refers to hospital acquisition of physician practices—an increasing trend in recent years. This type of integration has shown to be associated with higher prices.<sup>15</sup>

Lack of transparency in the pricing of services and a limited amount of consumer comparison shopping could be contributing factors for persistence in price differential across sites of care.<sup>16</sup> Our analysis demonstrates opportunities for OOP savings if individuals elected to comparison shop; evidence shows that consumers select

lower-cost providers when presented with comparative price information.<sup>17</sup> Other factors that could explain price differential include requirements for hospitals to have standby capacity and resources to perform a wide array of services, provide indigent care, etc.<sup>10</sup> Lower payments for the same services in ASCs when compared with hospitals could be due to specialization in certain services, exclusiveness of services provided, and ASCs' ability to perform procedures and surgeries in less time than a hospital outpatient department.<sup>18</sup> Additional research is needed to understand the factors driving such price differentials to ensure that appropriate solutions are implemented to address this issue.

### Limitations

Our results are limited to the time period and payers that contributed data to the Truven Health MarketScan databases throughout the study period. Any potential changes in payer mix during the study period that influenced any temporal trends were likely minimal due to the stable volume of and average payment for procedures throughout the study period. Furthermore, we observed that price differentials were similar to those reported in previous research that utilized data from a single-payer source, suggesting that payer mix is an unlikely source of the observed trends in HOPD-to-PO price ratios.<sup>12</sup> Second, our analysis focused on 7 healthcare services; additional research is needed to determine if the study findings regarding site-specific price differential and volume shifting are similar or different for other services. Consequently, the full implications for impact on the total national

healthcare spending are currently unknown. Finally, our study did not focus on the reasons for the observed site-specific price differentials. Further research is needed to identify the reasons for both the present site-specific price differentials and for their observed recent growth.

## CONCLUSIONS

Our study shows the existence of price differentials for the same medical services delivered at different sites of care at a national level, and that these differences are increasing over time. This increase in differential was accompanied by shifts in volume of services from less expensive (PO) to more expensive (HOPD) settings. The resulting additional spending is non-trivial: the price differential between HOPD and PO was associated with \$1.9 billion more in healthcare spending for the analyzed 7 services in 2013. Additional research is needed to understand the factors driving such price differentials to ensure that appropriate solutions are implemented to address this issue.

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**Address correspondence to:** Aparna Higgins, MA, American's Health Insurance Plans, 601 Pennsylvania Ave, NW, South Building, Ste 500, Washington, DC 20004. E-mail: ahiggins@ahip.org.

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## eAppendix 1

### A1. Average Patient Charlson Comorbidity Index Score, by Site of Care (2013)

Clinical Setting	Average CCI Score
CPT code 43239 (upper gastrointestinal endoscopy)	
PO	0.5
HOPD	0.6
ASC	0.5
CPT code 45378 (colonoscopy)	
PO	0.4
HOPD	0.4
ASC	0.3

ASC indicates ambulatory surgical center; CCI, Charlson comorbidity index; CPT, Current Procedural Terminology; HOPD, hospital outpatient department; PO, physician office.

### A2. Percent of Patients by Charlson Comorbidity Index Score, By Site of Care (2013)

Clinical Setting	CCI Score = 0	CCI Score = 1	CCI Score >1
CPT code 43239 (upper gastrointestinal endoscopy): % of patients			
PO	68.1	20.5	11.4
HOPD	65.0	21.8	13.2
ASC	71.0	18.5	10.5
CPT code 45378 (colonoscopy): % of patients			
PO	75.3	15.9	8.8
HOPD	73.9	16.5	9.5
ASC	78.1	14.2	7.7

ASC indicates ambulatory surgical center; CCI, Charlson comorbidity index; CPT, Current Procedural Terminology; HOPD, hospital outpatient department; PO, physician office.

### A3. Price Differential by Charlson Comorbidity Index Score by Site of Care (2013)<sup>a</sup>

Measure	Payment Ratio for		
	CCI Score = 0	CCI Score = 1	CCI Score >1
CPT code 43239 (upper gastrointestinal endoscopy)			
Payment ratio: HOPD to PO	3.37	3.57	3.63
Payment ratio: HOPD to ASC	1.74	1.74	1.74
CPT code 45378 (colonoscopy)			
Payment ratio: HOPD to PO	2.67	2.83	2.86
Payment ratio: HOPD to ASC	1.70	1.67	1.67

ASC indicates ambulatory surgical center; CCI, Charlson comorbidity index; CPT, Current Procedural Terminology; HOPD, hospital outpatient department; PO, physician office.

<sup>a</sup>All price differentials by site of care displayed in the table are statistically significant at the level of  $P < .001$ .

## eAppendix 2

### B1. Proportion of Visits by Patient Age, % (2013)

Clinical Setting	0-17 years	18-34 years	35-44 years	45-54 years	55-64 years
99213 (office/outpatient visit, est, 15 minutes)					
PO	24.5	17.2	15.5	20.7	22.2
HOPD	14.7	18.6	15.6	22.7	28.5
99215 (office/outpatient visit, est, 40 minutes)					
PO	14.8	14.3	15.6	24.8	30.5
HOPD	19.3	13.9	12.8	22.3	31.7
70450 (CT head/brain w/o dye)					
PO	11.7	21.9	18.6	23.5	24.4
HOPD	16.8	22.4	16.5	21.4	23.0
72148 (MRI lumbar spine w/o dye)					
PO	3.2	14.7	20.5	30.1	31.6
HOPD	5.3	14.0	19.3	29.7	31.6
71020 (chest x-ray)					
PO	9.7	13.7	17.3	27.5	31.8
HOPD	14.6	13.2	15.2	25.1	32.0
43239 (upper gastrointestinal endoscopy)					
PO	1.2	16.3	19.9	31.2	31.3
HOPD	10.0	15.5	17.9	27.1	29.6
ASC	1.9	16.5	19.2	29.8	32.6
45378 (colonoscopy)					
PO	0.1	4.4	9.7	44.0	41.7
HOPD	0.3	5.4	9.9	42.0	42.4
ASC	0.2	5.3	9.8	42.9	41.8

ASC indicates ambulatory surgical center; CT, computed tomography; est, established patient; HOPD, hospital outpatient department; MRI, magnetic resonance imaging; PO, physician's office; w/o, without.

### B2. Proportion of Visits by Patient Gender, % (2013)

Clinical Setting	Men	Women
99213 (office/outpatient visit, est, 15 minutes)		
PO	41.9	58.1
HOPD	41.1	59.0
99215 (office/outpatient visit, est, 40 minutes)		
PO	41.5	58.5
HOPD	43.6	56.4
70450 (CT head/brain w/o dye)		
PO	39.0	61.0
HOPD	44.5	55.5
72148 (MRI lumbar spine w/o dye)		
PO	45.0	55.0
HOPD	44.2	55.8
71020 (chest x-ray)		
PO	46.4	53.6
HOPD	45.4	54.6
43239 (upper gastrointestinal endoscopy)		
PO	41.8	58.2
HOPD	40.4	59.6
ASC	39.2	60.8
45378 (colonoscopy)		
PO	45.0	55.1
HOPD	42.6	57.5
ASC	41.3	58.8

ASC indicates ambulatory surgical center; CT, computed tomography; est, established patient; HOPD, hospital outpatient department; MRI, magnetic resonance imaging; PO, physician's office; w/o, without.