

## Location, Location, Location: Cost Differences in Health Care Services by Site of Treatment — A Closer Look at Lab, Imaging, and Specialty Medications

By Paul Fronstin, Ph.D., Employee Benefit Research Institute, and M. Christopher Roebuck, Ph.D., RxEconomics, LLC

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### AT A GLANCE

It is estimated that 20–30 percent of overall health care spending may be wasteful. Overall, employers and workers spent \$244.2 billion to \$366.3 billion on six domains of waste: failures of care delivery, failures of care coordination, overuse of low-value health care services, fraud and abuse, administrative complexities, and pricing failure — or when prices migrate from what is expected in a well-functioning market.

In this *Issue Brief*, we focus on that last area of waste: pricing failure when it comes to lab; imaging; and special medications for conditions such as multiple sclerosis, rheumatoid arthritis, and other inflammatory disorders. This analysis is important because care is shifting from physicians' offices (POs) to more costly hospital outpatient departments (HOPDs). Compounding this shift in care is the fact that prices for hospital-based outpatient care are increasing faster than physician prices. Ultimately, employers and workers bear the brunt of cost differences when HOPDs perform services that can be provided in less costly POs or in stand-alone lab or imaging facilities.

#### Key Findings: Location matters...

- **To employers and employees:**

- Overall, employers and workers would collectively save \$11.2 billion if price differentials between HOPDs and other sites of treatment were eliminated for each of the 25 health care services examined in this report.
- Employers would save \$9 billion or 80 percent of the total, whereas workers and their dependents would save \$2.2 billion or 20 percent.

- **When it comes to a wide variety of health care services:**

- Employers and workers could reduce their spending on lab services as much as 69 percent, depending on the type of lab service, if price differentials between HOPDs and other sites of treatment were eliminated.
- Savings could be as high as 56 percent for chest X-rays, 49 percent for echocardiograms, and 41 percent for DEXA scanning.
- If site-of-treatment price differentials for specialty medications were eliminated, employers and workers would save as much as 36 percent, depending on the medication.

While \$11.2 billion does not seem like much savings compared with the \$1 trillion spent on health benefits by employers and workers, the potential for savings is much greater, as our analysis is based on only 25 health care services. Employers could cut costs by 1 percent simply by shifting patients away from more costly HOPD settings or by negotiating site-neutral pricing for the 25 health care services examined in this report.

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## Introduction

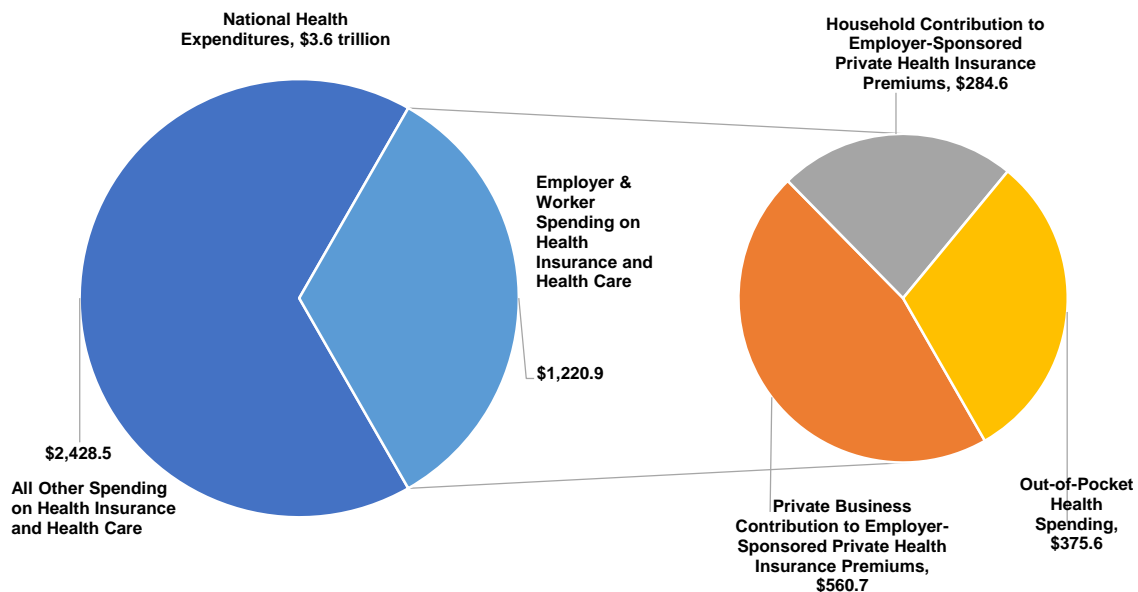
Spending on health care in the United States reached \$3.6 trillion in 2018. About one-third, or \$1.2 trillion, was spent on health insurance premiums and out-of-pocket payments by employers and individuals (Figure 1). Employers paid \$560.7 billion toward health insurance premiums<sup>1</sup> for their workers. Workers paid \$284.6 billion toward health insurance premiums as well. Another \$375.6 was spent on out-of-pocket expenses for health care services.

However, studies have found that 20–30 percent of overall spending may be considered wasteful.<sup>2</sup> Waste comes from (1) failures of care delivery, (2) failures of care coordination, (3) overuse of low-value health care services, (4) fraud and abuse, (5) administrative complexities, and (6) pricing failure.<sup>3</sup> Overall, employers and workers spent \$244.2 billion to \$366.3 billion on these six domains of waste.

### Pricing Failure

According to Berwick and Hackbarth (2012), pricing failure occurs when “prices migrate far from those expected in well-functioning markets, that is, the actual costs of production plus a fair profit.” In prior research, we examined payment differentials for oncology medications by site of treatment for the 37 most prescribed medications that together captured 92 percent of total chemotherapy use and spending (Fronstin, Roebuck, and Stuart 2020). We found that, had hospital outpatient department (HOPD) unit prices matched physician office (PO) prices, holding drug mix and treatment intensity constant, third-party payers would have saved \$9,766 per use of these medicines in 2016, a savings of 45 percent.

Figure 1  
National Health Spending: Employer and Individual Spending on Health Insurance and Health Care, 2018  
(in billions)



Source: National Health Expenditures, <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical>

In this *Issue Brief*, we focus on waste caused by pricing failure, analyzing 25 health care services in which there is potential pricing failure. These services fall into three categories: lab; imaging; and special medications for conditions such as multiple sclerosis, rheumatoid arthritis, and other inflammatory disorders. This analysis is important because care is shifting from POs to more costly hospital outpatient departments (HOPDs). For example, in 2004, approximately 94 percent of chemotherapy infusions were administered in physicians’ offices (POs), but by 2014, that percentage had dropped to 57 percent with a corresponding shift toward HOPDs.<sup>4</sup> Compounding the shift in care from POs to HOPDs is the fact that prices for hospital-based outpatient care are growing faster than physician prices. A recent study found that between 2007 and 2014, prices for hospital-based outpatient care increased 25 percent, while physician prices grew 6 percent.<sup>5</sup> Ultimately, employers and workers bear the brunt of cost differences when HOPDs perform services that can be provided in less costly POs or in stand-alone lab or imaging facilities.

## Data and Methods

### Data and Study Sample

This study makes use of the 2018 IBM® MarketScan® Commercial Claims and Encounters Database (CCAE). The CCAE database contains member enrollment information as well as adjudicated inpatient and outpatient medical and pharmacy claims. We constructed an analytical dataset of adults (ages 18–64) who were continuously enrolled in employer-sponsored insurance in 2018. Members in capitated plans were excluded. A total of 10.9 million individuals met these criteria.

Sample averages for the following characteristics are reported in Figure 2: gender, age, relationship to policyholder, and plan type.

Figure 2 Sample Characteristics, 2018	
2018	
<b>Gender</b>	
Male	48%
Female	52%
<b>Age, years</b>	
18–24	16%
25–34	17%
35–44	21%
45–54	24%
55–64	23%
<b>Person Covered</b>	
Policyholder	59%
Spouse	25%
Child/other dependent	15%
<b>Type of Health Plan</b>	
HMO/EPO	12%
PPO/POS	55%
HRA	15%
HSA-eligible health plan	16%
Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.	
Note: HMO=health maintenance organization; EPO=exclusive provider organization; PPO=preferred provider organization; POS=point of service; HRA=health reimbursement arrangement; HSA=health savings account.	

## Outpatient Services

In this research, we were interested in analyzing outpatient health services that generally met three conditions:

1. The health care services ranked highly in terms of utilization or cost and therefore contributed significantly to overall health care costs.
2. The health care services were frequently, but not always, performed in HOPDs.
3. The health care services also had substantial penetration in other treatment settings.

The second criterion was meant to highlight services where cost savings opportunities currently exist via either price negotiations or site-of-care shifts.

However, the third criterion is perhaps the most important. Identifying services that have a substantial penetration in other treatment settings may also indicate that the procedure does not necessarily require delivery in an HOPD. To confirm this, we had two clinicians (MDs) review and approve our final list.

As seen in Figure 3, a total of 25 outpatient health service utilization measures were constructed using relevant procedure (and in some cases also diagnosis) codes from claims. Included were:

- Five laboratory tests: metabolic panel, lipid panel, drug test, complete blood count, and vitamin D test.
- Five imaging services that are either always or sometimes conducted via magnetic resonance imaging (MRI): spine, upper joint, lower joint, imaging specifically for low-back pain, and imaging specifically for uncomplicated headache.
- Seven other (non-MRI) imaging procedures: colonoscopy, chest X-ray, mammogram, echocardiogram, DEXA scanning,<sup>6</sup> carotid artery stenosis screening, and electrocardiogram (EKG) screening specifically for low-risk patients.
- Eight non-oncology, infused specialty medications: primary immunodeficiency drug #1, primary immunodeficiency drug #2, primary immunodeficiency drug #3, autoimmune disease drug #1, multiple sclerosis drug #1, multiple sclerosis drug #2, supportive cancer drug, and autoimmune disease drug #2.

These specialty medications are used to treat conditions such as multiple sclerosis, rheumatoid arthritis, and other inflammatory disorders. They are usually administered by a health care professional through an intravenous (IV) injection or infusion.

Use of these health care services varied considerably. Some of these services were quite common, while others were quite rare. For instance, 38 percent of the sample had lab work for a lipid panel. In contrast, only about 1 percent of the sample had imaging via MRI, and very few people used any of the specialty medications examined. This is no surprise, as these medications are used to treat chronic conditions that are often rare, such as autoimmune diseases and multiple sclerosis (MS), which has a prevalence rate of about 0.1 percent in the United States, and not all MS patients are on such medications.

It is important to note that six of the health care services examined in this report — vitamin D testing, imaging specifically for low-back pain, imaging specifically for uncomplicated headache, DEXA scanning, carotid artery stenosis screening, and EKG screening specifically for low-risk patients — are considered to be of low value. The *Choosing Wisely* campaign<sup>7</sup> — which identifies wasteful health care spending — suggests that any use of these services is of little to no clinical value.<sup>8</sup> To the degree that HOPDs charge more for these services than other sites of care, these services would fall into two categories of waste: overuse of low-value health care services and pricing failure.

**Figure 3**  
**Use of Various Health Care Services, 2018**

<b>2018</b>	
<b><u>Lab</u></b>	
Metabolic panel	28%
Lipid panel	38%
Drug test	2%
Blood count	26%
Vitamin D screening	10%
<b><u>Imaging via MRI</u></b>	
MRI spine	1%
MRI upper joint	1%
MRI lower joint	2%
Imaging for low-back pain	1%
Imaging for uncomplicated headache	0.2%
<b><u>Imaging via Non-MRI</u></b>	
Colonoscopy	2%
Chest X-ray	7%
Mammogram	14%
Echocardiogram	3%
DEXA scanning	2%
Carotid artery stenosis screening	1%
EKG screening for low-risk patients	4%
<b><u>Specialty Medications</u></b>	
Primary immunodeficiency drug #1	0.01%
Primary immunodeficiency drug #2	0.01%
Primary immunodeficiency drug #3	0.01%
Autoimmune disease drug #1	0.09%
Multiple sclerosis drug #1	0.02%
Multiple sclerosis drug #2	0.02%
Supportive cancer drug	0.08%
Autoimmune disease drug #2	0.03%
Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.	

## Analysis

For each of the 25 services, we calculated the proportion of utilization (claims or units for medications) delivered in each of the following sites of care: HOPD, PO, laboratory, ambulatory surgical center, home, and other. Of course, the alternative places of service to HOPDs differ across procedures, for example, medications administered in HOPDs vs. POs, or lipid panels in HOPDs vs. labs. We then derived the average cost using the allowed amounts for each service by site of care. Average HOPD costs were subsequently divided by average non-HOPD costs to derive the utilization-weighted average in all other sites of care. Hence, results under 100 percent reflect lower HOPD costs relative to non-HOPD, whereas numbers exceeding 100 percent represent higher HOPD costs relative those in the non-HOPD settings.

We also estimated the potential aggregate savings to the U.S. health care system under a scenario where non-HOPD prices prevail for all 25 health services. More specifically, we “repriced” all HOPD utilization using average-weighted non-HOPD prices and then aggregated the observed spending differentials for all individuals in the sample. We then extrapolated to the national level using an estimate of 128.5 million adults with employer-sponsored insurance in 2018.<sup>9</sup>

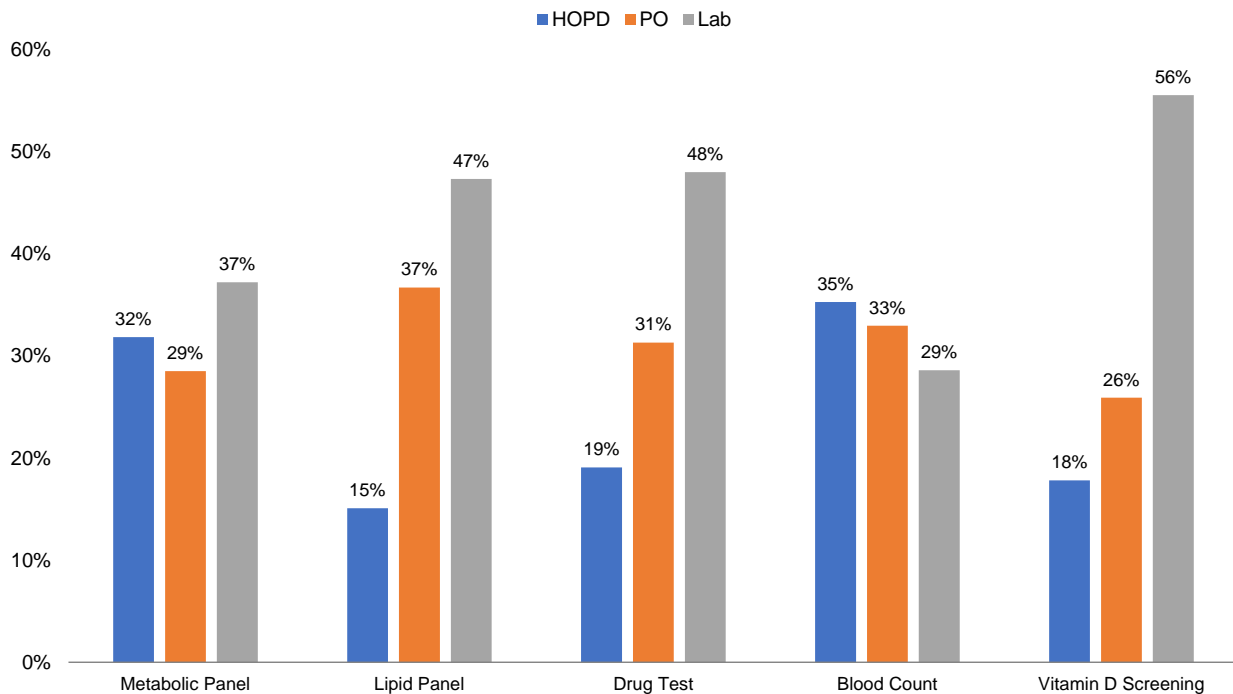


Finally, using average member out-of-pocket amounts — deductible + coinsurance + copay from claims — in the same way as total allowed amounts were employed in all calculations previously described, we were also able to split the estimated aggregate savings into the portions that might accrue to members vs. plan sponsors.

## Where Do Plan Members Receive Their Health Care Services?

The distribution of treatment settings for lab services is shown in Figure 4. Lab services are provided in three types of settings: HOPDs, POs, and stand-alone lab facilities. Metabolic panels and blood counts were nearly equally distributed across the three settings. However, lab facilities processed about one-half of lipid panels, drug tests, and vitamin D screenings, while POs accounted for one-quarter to one-third of these services, and HOPDs accounted for 15–19 percent.

Figure 4  
Distribution of Lab Services, by Site of Service



Notes: HOPD=hospital outpatient departments; PO=physician offices.  
Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

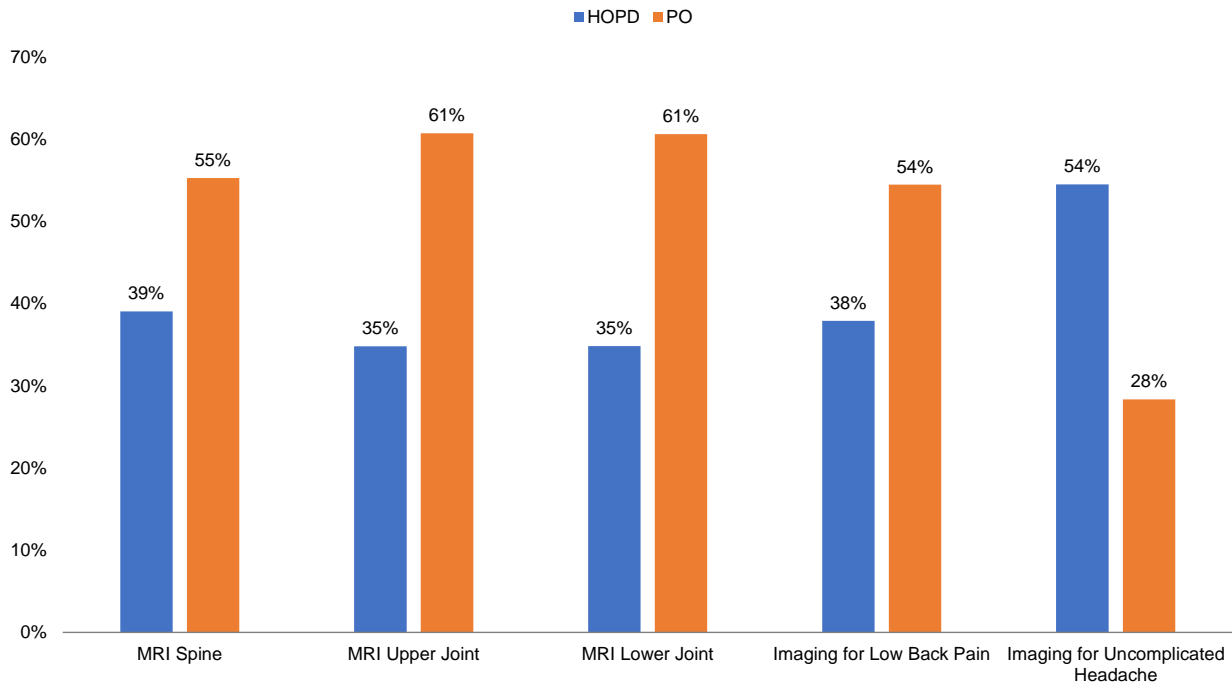
The distribution of treatment settings for MRI services is shown in Figure 5. MRI services were provided mainly in only 2 settings: HOPDs and POs. Those claims that were coded as "Other" were likely miscoded. POs accounted for 54–61 percent of MRIs for 4 of the 5 services examined. However, HOPDs accounted for the majority of imaging for uncomplicated headaches.

Similarly to the other imaging services we examined, those not provided via MRI were also provided in only two settings, with one exception. Colonoscopy services were split nearly evenly between HOPDs and ambulatory surgical centers (Figure 6). Only 8 percent of colonoscopies were provided in POs. Otherwise, chest X-rays and mammograms were more likely to be provided in HOPDs than POs, while echocardiograms, DEXA scanning, and carotid artery stenosis screening were more likely to be provided in POs than in HOPDs. EKG screening for low-risk patients was nearly always provided in POs.

When it comes to site of treatment, specialty medications can be further grouped into two categories: the three primary immunodeficiency medications and the other five medications. The three immunodeficiency medication infusions were often administered in a patient's home (40–63 percent of the time) (Figure 7), whereas the other five specialty

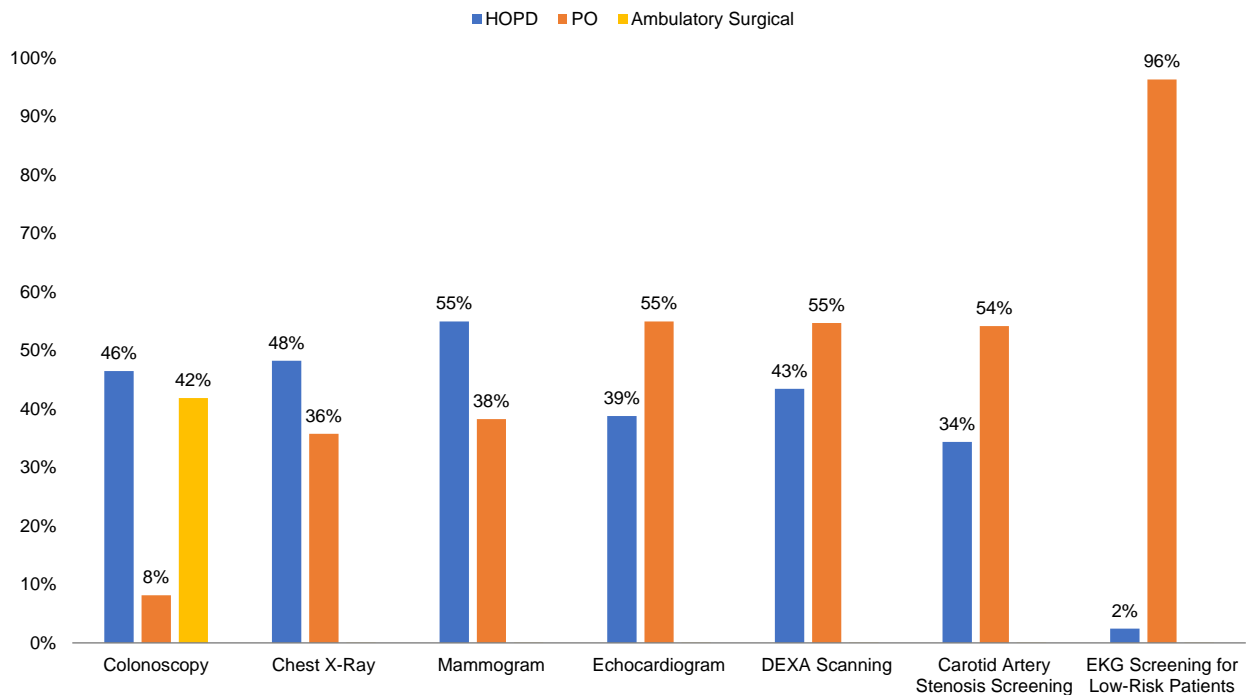
medications were rarely administered at home. These infusions occurred in both HOPDs and POs, and while they were not evenly split between the two settings, neither setting was particularly dominant.

**Figure 5**  
**Distribution of Various MRI Services, by Site of Service**



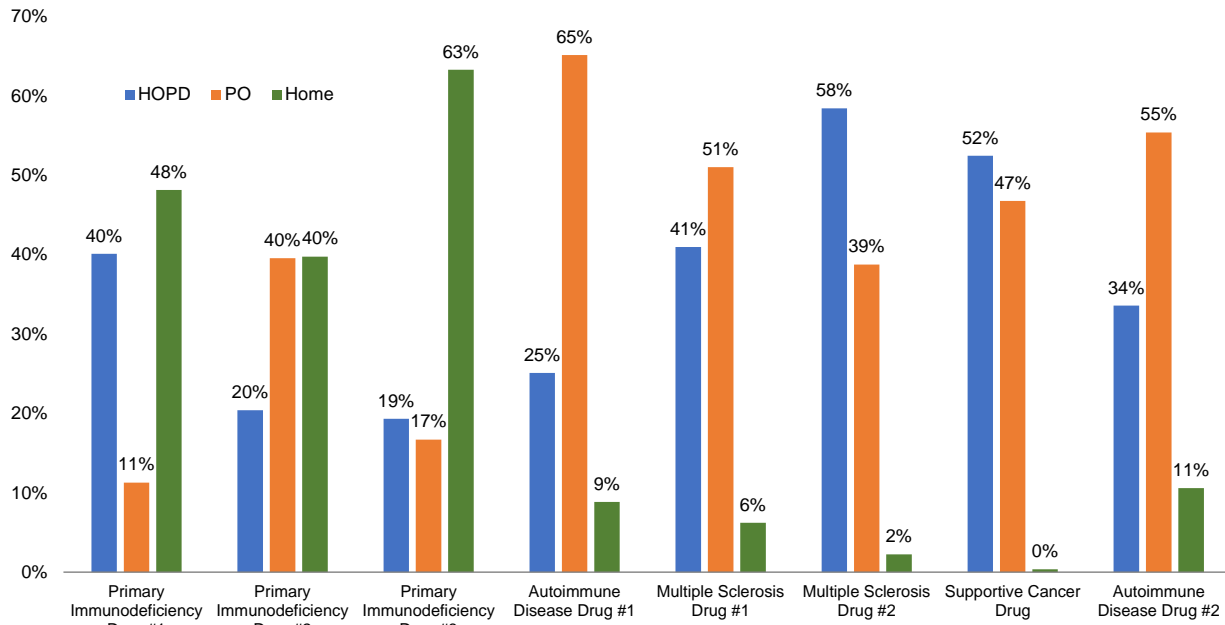
Notes: HOPD=hospital outpatient departments; PO=physician offices. Numbers do not add to 100% because sites of service coded as "other" are not shown.  
Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

**Figure 6**  
**Distribution of Various Non-MRI Imaging Services, by Site of Service**



Notes: HOPD=hospital outpatient departments; PO=physician offices. Numbers do not add to 100% because sites of service coded as "other" are not shown.  
Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

Figure 7  
Distribution of Various Specialty Medications, by Site of Service

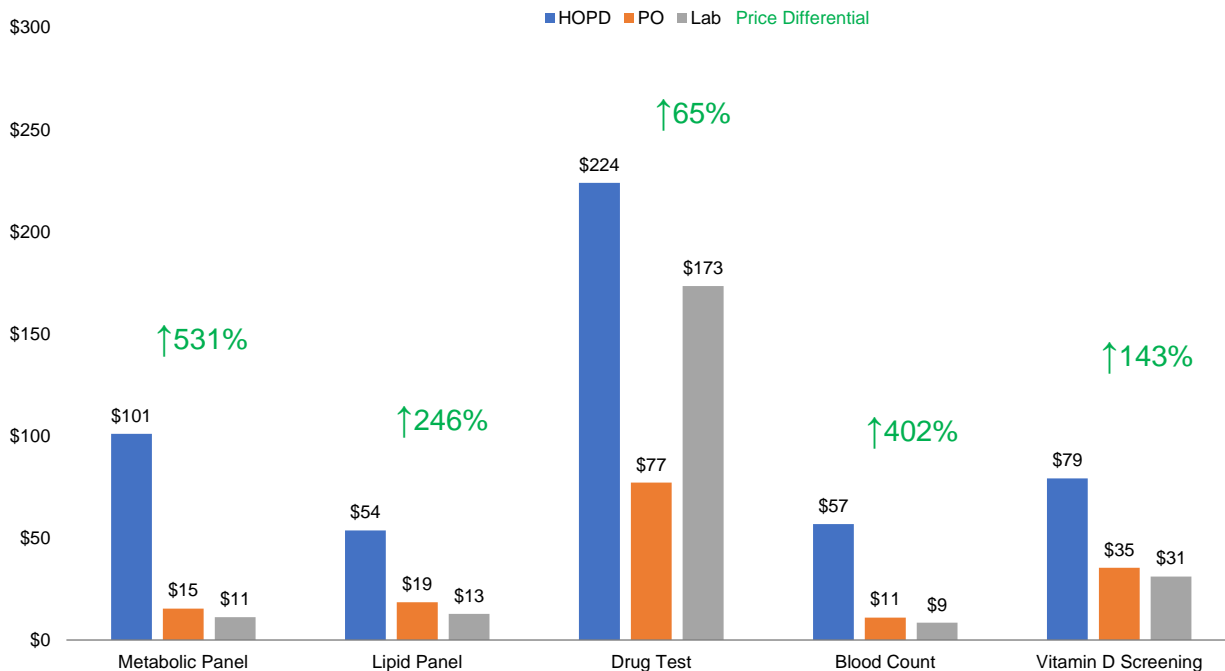


Notes: HOPD=hospital outpatient departments; PO=physician offices.  
Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

### How Do Allowed Charges Differ by Site of Treatment?

Allowed charges were higher in HOPDs than in POs and other sites of treatment for all 25 health care services examined in this study. Findings on price differentials for lab services are shown in Figure 8. Two types of data points are shown: the actual allowed charges by site of treatment and the price differential in percentage terms. To calculate the price differential, a blended price for non-HOPD settings was used. The blended price was weighted by the percentage of services provided in each setting.

Figure 8  
Average Allowed Charge by Site of Service and Weighted Percentage Price Differential for Lab Services

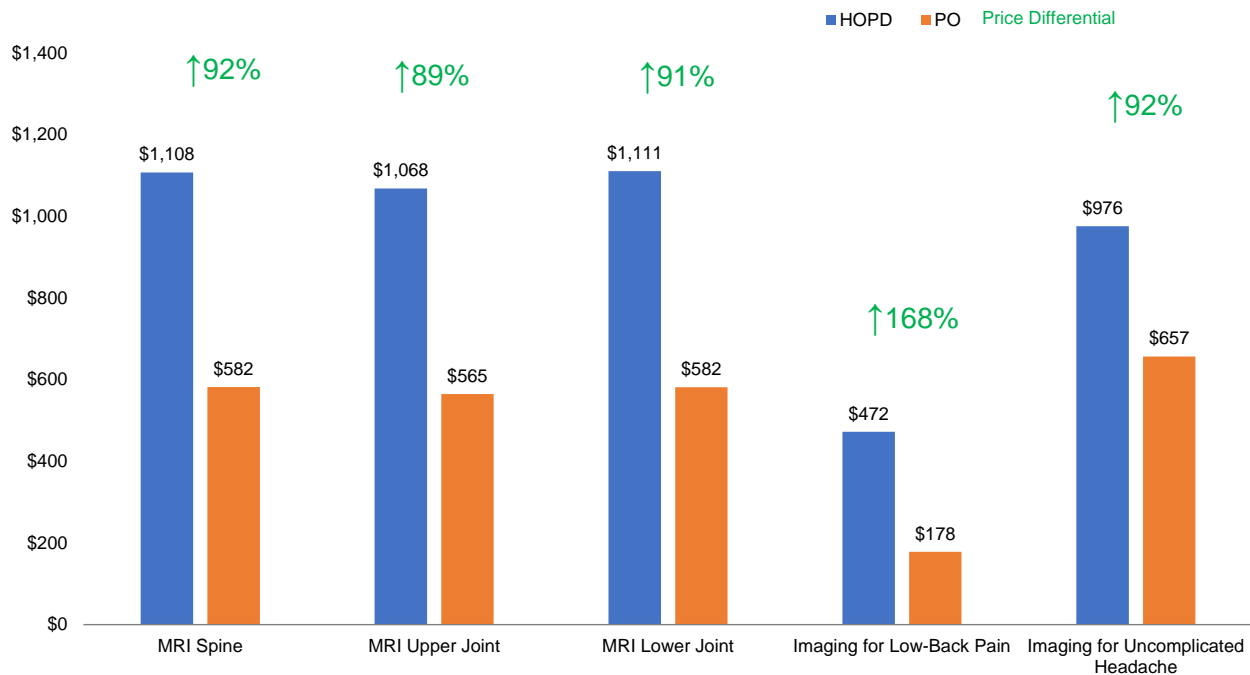


Notes: HOPD=hospital outpatient departments; PO=physician offices.  
Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

In general, allowed charges are very similar for lab services provided in POs and labs. As an example, the allowed charge for a metabolic panel was \$15 in the PO and \$11 in the lab. Drug tests were the only service in which there was a significant difference in the allowed charge between POs and labs, with lab rates being significantly higher. Overall, price differentials between HOPDs and other sites of treatment ranged widely — from 65 percent to 531 percent. Price differentials for drug tests accounted for the 65 percent at the bottom of the range. Had the allowed charge for drug tests in labs been equal to the allowed charge in POs, the price differential would have been closer to 200 percent, more in line with the other lab services’ price differentials.

There was more consistency in allowed charges and price differentials for the various MRI services examined in this study. Allowed charges for MRI services were in the \$1,100 range in HOPDs, while they were less than \$600 in POs (Figure 9). The allowed charge in HOPDs was roughly 90 percent higher for 4 of the 5 services examined in Figure 9. The only exception was imaging for low-back pain. While MRIs can be used for low-back pain and uncomplicated headaches, X-ray machines are often used to diagnose these conditions, which would explain why the allowed charges are lower. Despite the allowed charges for imaging for low-back pain being much lower than for the other services examined in Figure 9, the price differential was much higher: 168 percent higher on average in HOPDs than in POs.

Figure 9  
Average Allowed Charge by Site of Service and Weighted Percentage Price Differential for Various MRI Services



Notes: HOPD=hospital outpatient departments; PO=physician offices.  
Source: Authors’ analysis of IBM MarketScan administrative enrollment and claims data.

Allowed charges for three sites of treatment for non-MRI imaging services are shown in Figure 10. While the allowed charges varied significantly by type of imaging, allowed charges for HOPDs were consistently above allowed charges for POs. And in the case of colonoscopy, allowed charges for HOPDs were above allowed charges for ambulatory surgical centers as well. Overall, allowed charges were 35 to 234 percent higher in HOPDs than in POs.

The allowed charges shown in Figure 11 for specialty medications reflect the per-unit price of the medication. The largest price difference per unit was for primary immunodeficiency drug #1, which was 84 percent more expensive when administered at an HOPD vs. at a PO or at home. It is important to recognize that for many of these medications, multiple units will be used per year (Figure 12). For example, the average patient using multiple sclerosis drug #1 — which was priced only \$13 more when taken at an HOPD vs. at home — took 2,566 units per infusion session. In contrast, patients using the much more costly supportive cancer drug only used 4 units per infusion session.

Generally, the allowed charge for home infusions was somewhat comparable to the allowed charge for POs. There were exceptions, however, such as autoimmune disease drug #1. Still, the incidence of home infusions was quite small, so the higher allowed charge for the home infusion did not have a material impact on the price differential. Overall, there were significant price differentials per unit of specialty medication, ranging from 15–84 percent.

Figure 10  
Average Allowed Charge by Site of Service and Weighted Percentage Price Differential for Various Non-MRI Imaging Services

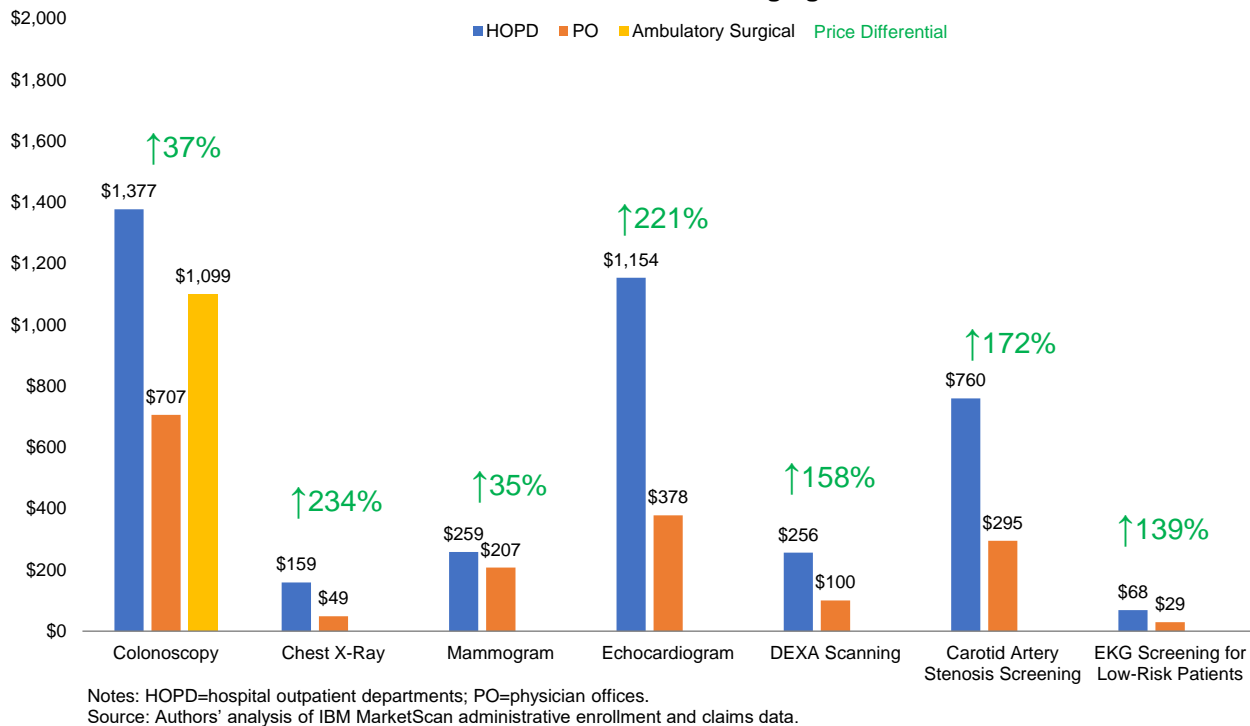
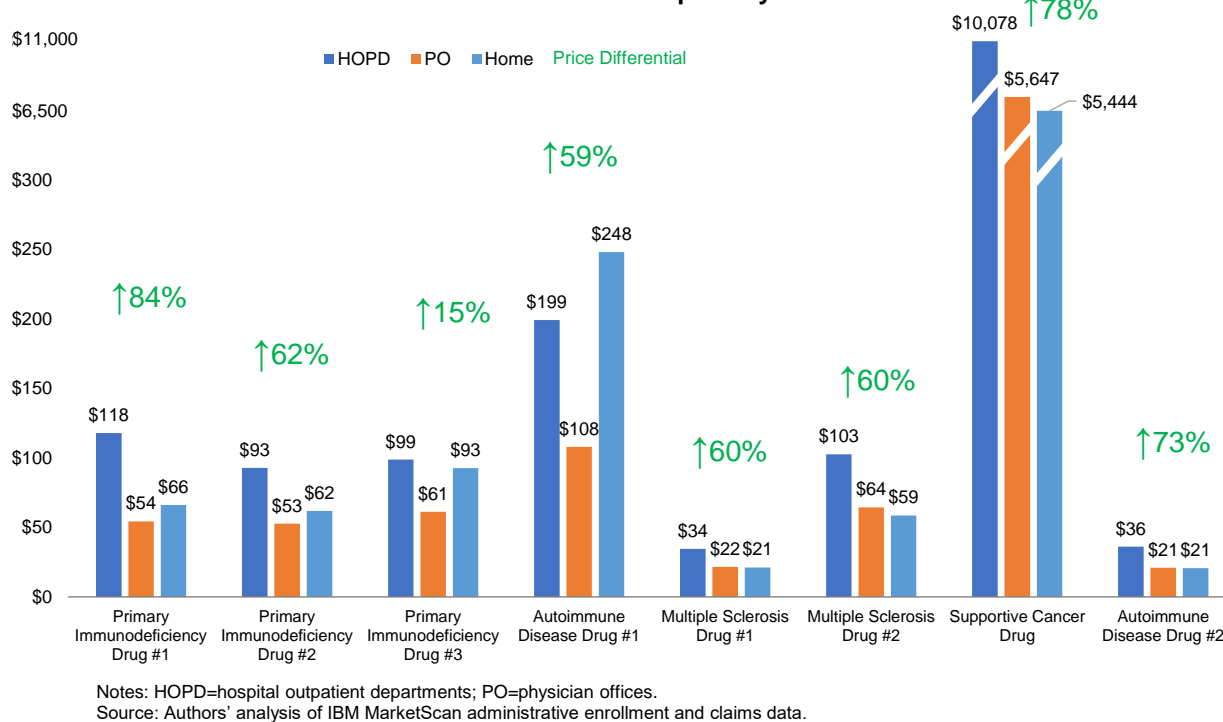


Figure 11  
Average Allowed Charge by Site of Service and Weighted Percentage Price Differential for Various Specialty Medications



**Figure 12**  
**Average Number of Units of Specialty Medication per Patient, 2018**

<b>Specialty Medications</b>	
Primary immunodeficiency drug #1	899
Primary immunodeficiency drug #2	1,618
Primary immunodeficiency drug #3	1,093
Autoimmune disease drug #1	321
Multiple sclerosis drug #1	2,566
Multiple sclerosis drug #2	909
Supportive cancer drug	4
Autoimmune disease drug #2	1,606

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

## Potential Savings

Total potential savings for each of the 25 health care services examined in the paper are shown in Figure 13. Employers and workers could reduce their spending on lab services by between 12 percent and 69 percent, depending on the type of lab service, if price differentials between HOPDs and other sites of treatment were eliminated.

When it comes to imaging, savings could be as high as 56 percent for chest X-rays, 49 percent for echocardiogram, and 41 percent for DEXA scanning. For MRI-related imaging, savings amounted to 39 percent for imaging for low-back pain, 34 percent for imaging for uncomplicated headache, 28 percent for MRIs of the spine, and 25 percent for MRIs of upper and lower joints. Savings for mammography would be as high as 17 percent, and for colonoscopy they would be 15 percent.

If site-of-treatment price differentials for specialty medications were eliminated, employers and workers would save between 4 percent and 36 percent, depending on the medication.

In the aggregate, employers and workers would collectively save \$11.2 billion if price differentials between HOPDs and other sites of treatment were eliminated (Figure 14). Employers would save \$9 billion or 80 percent of the total, whereas workers and their dependents would save \$2.2 billion or 20 percent. Workers and their dependents would realize 33 percent of the savings in labs, 22 percent of the savings in imaging, and 3 percent of the savings in specialty medications.

The aggregate savings in specialty medications for workers and their dependents is relatively low. That's because individuals on specialty medications are typically part of the small percentage of the population who use a large percentage of the health care.

### High Users of Health Care Services

In prior research, we found that 10 percent of the population accounts for 70 percent of health care spending (Fronstin and Roebuck 2019). Within this group, 50–60 percent not only reached their deductible, but they also reached their maximum out-of-pocket limit. As a result, much of the health care these people use are subject to low or no cost sharing, which lowers the savings potential for these plan members from any reduction in price differentials. Employers would continue to realize savings if these plan members switched from high-cost to low-cost providers, because employers pay for nearly all of these claims.

Figure 13  
**Percentage Savings From Eliminating Site-of-Treatment Price Differentials, by Health Care Service**

<b>Employer &amp; Employee Savings</b>	
<b>Lab</b>	
Metabolic panel	69%
Lipid panel	29%
Drug test	12%
Blood count	12%
Vitamin D screening	21%
<b>Imaging</b>	
Colonoscopy	15%
Chest X-ray	56%
MRI spine	28%
MRI upper joint	25%
MRI lower joint	25%
Mammogram	17%
Echocardiogram	49%
Imaging for low-back pain	39%
Imaging for uncomplicated headache	34%
DEXA scanning	41%
Carotid artery stenosis screening	37%
EKG screening for low-risk patients	3%
<b>Specialty Medications</b>	
Primary immunodeficiency drug #1	35%
Primary immunodeficiency drug #2	14%
Primary immunodeficiency drug #3	4%
Autoimmune disease drug #1	16%
Multiple sclerosis drug #1	26%
Multiple sclerosis drug #2	36%
Supportive cancer drug	32%
Autoimmune disease drug #2	24%
Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.	

<b>Figure 14</b>			
<b>Aggregate Savings</b>			
<b>(in millions)</b>			
	Employer & Employee Savings	Employer Savings	Employee Savings
<b>Total</b>	<b>\$11,265</b>	<b>\$9,020</b>	<b>\$2,246</b>
<b>Lab</b>			
Metabolic panel	1,601	1,030	570
Lipid panel	356	262	94
Drug test	97	71	26
Blood count	933	631	302
Vitamin D screening	130	84	46
<b>Total</b>	<b>3,118</b>	<b>2,079</b>	<b>1,039</b>
<b>Imaging</b>			
Colonoscopy	403	372	32
Chest X-ray	681	432	249
MRI spine	391	285	106
MRI upper joint	207	147	60
MRI lower joint	414	286	128
Mammogram	711	707	3
Echocardiogram	1,476	1,129	347
Imaging for low-back pain	273	184	89
Imaging for uncomplicated headache	85	62	23
DEXA scanning	178	142	36
Carotid artery stenosis screening	141	112	29
EKG screening for low-risk patients	5	4	1
<b>Total</b>	<b>4,964</b>	<b>3,861</b>	<b>1,103</b>
<b>Specialty Medications</b>			
Primary immunodeficiency drug #1	173	169	5
Primary immunodeficiency drug #2	201	196	6
Primary immunodeficiency drug #3	40	39	1
Autoimmune disease drug #1	723	680	43
Multiple sclerosis drug #1	267	259	8
Multiple sclerosis drug #2	567	553	14
Supportive cancer drug	906	892	14
Autoimmune disease drug #2	306	292	14
<b>Total</b>	<b>3,183</b>	<b>3,080</b>	<b>104</b>

Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

## Conclusion and Implications for Employers and Insurers

Our findings have implications for both employers and insurers. There are a number of actions these third-party payers can take. First, they can exert pressure on hospitals to shift from discounted charge contracts based on a multiple of Medicare to some other prospective case rate. Employers could also exert such pressure on health plans to do the same with the hospitals in their networks. A coalition of employers across Illinois, Iowa, and Wisconsin, is already trying this.<sup>10</sup>



In the absence of such market power, employers and insurers can attempt to engage patients through increased price transparency. However, price transparency by itself has been found to be insufficient in reducing hospital prices<sup>11</sup> unless combined with plan design changes intended to steer patients to less costly sites of treatment. For instance, employers and insurers can use a combination of value-based insurance design (VBID) and reference pricing to vary patient cost sharing based on the choices that they make regarding choice of health care provider.

Under VBID, cost sharing is aligned with the value of health care services received. It is built on the principle of lowering or removing financial barriers to essential, high-value clinical solutions.<sup>12</sup> To the degree that the quality of health care services does not vary with site of treatment, VBID could be used to encourage patients to seek treatment in POs by lowering cost sharing, relative to HOPDs, when services are received at that site of care.

In contrast to VBID, reference pricing raises cost sharing when patients seek care at certain health care providers where the quality or outcome of treatment is not dependent on the site of care. Under reference pricing, employers or insurers would pay a fixed amount or limit their contributions toward the cost of a specific health care service, and health plan members must pay the difference in price if a more costly site of treatment is selected.<sup>13</sup> In context of this study, a reference price could be set at a level that corresponds closest to the cost of services in a PO. If patients chose to receive services in a HOPD, they would pay the difference in costs. The expectation is that patients would engage with the recommending physician and choose the site of treatment based on not just recommendations but what it would cost them in out-of-pocket costs. In fact, research has shown that the influence of referring physicians is larger than the influence of cost sharing even when out-of-pocket costs are significantly high.<sup>14</sup>

One of the limitations of reference pricing is that health care providers below the reference price may increase prices to at or close to the reference price, offsetting some of the savings. This may happen to the degree that there is a competitive market and transparent pricing information.

Another thing to consider is which patients will be sensitive to the combination of price transparency and cost sharing changes. As shown in this paper, the cost of lab services and certain imaging are relatively low, while the cost of MRIs and specialty medications are relatively high. Even with information, patients may not seek out the lowest cost providers if the cost sharing savings is low. Hence, the potential for price transparency and higher cost sharing may be limited. And, we have argued in the past that high-cost claimants may not be sensitive to changes in cost sharing because many of these patients reach not only their deductible, but also their out-of-pocket maximum.<sup>15</sup> However, reference pricing might address this limitation. The cost sharing paid by a patient who exceeds the reference price can exceed the in-network maximum out-of-pocket limit as that amount is considered out-of-network and does not have to be counted in any accumulation related to the maximum out-of-pocket cost allowed for in network benefits, as prescribed by the Affordable Care Act.

Finally, instead of introducing financial incentives, which may or may not work, employers and insurers could move patients from HOPDs to other sites of treatment by removing the HOPDs from their network. Such an arrangement is most common in staff-model health maintenance organizations (HMOs) but can be applied more generally to any network plan. Providers could respond by lowering their prices so that they may return into the network. This strategy has its limitations as well. It may not work well in areas with limited provider choices.

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## Endnotes

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- <sup>1</sup> Employer spending on health insurance premiums includes direct payment of claims in self-insured plans.
- <sup>2</sup> Institute of Medicine of the National Academies (2010); Shrank, Rogstad, and Parekh (2019).
- <sup>3</sup> Berwick and Hackbarth (2012).
- <sup>4</sup> Winn et al. (2018).
- <sup>5</sup> Cooper et al. (2019).
- <sup>6</sup> DEXA is dual-energy X-ray absorptiometry.
- <sup>7</sup> The Choosing Wisely campaign promotes conversations between clinicians and patients to help patients choose care that is supported by evidence and truly necessary. The campaign includes recommendations from various medical societies. One example comes from the North American Spine Society, which recommends against the use of imaging of the spine within the first six weeks of an acute episode of low-back pain in the absence of red flags. More information can be found at <https://www.choosingwisely.org/>
- <sup>8</sup> Fronstin et al. (2020).
- <sup>9</sup> Author estimates from the 2020 Annual Social and Economic Supplement to the Current Population Survey.
- <sup>10</sup> Koller and Khullar (2019).
- <sup>11</sup> White and Whaley (2019).
- <sup>12</sup> See <http://vbidcenter.org/frequently-asked-questions/>
- <sup>13</sup> Fronstin and Roebuck (2014).
- <sup>14</sup> Chernew et al. (2019).
- <sup>15</sup> Fronstin and Roebuck (2019); Fronstin, Roebuck, and Stuart (2020).

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