

# THE SPREAD IN HOSPITAL CHARGEMASTER PRICES FOR COMMON DRUGS

How New Hospital Transparency  
Regulations Fall Short

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# OVERVIEW

The new Centers for Medicare & Medicaid (CMS) ruling requiring hospitals to provide transparent hospital pricing, unfortunately, comes up short. Most hospital chargemaster lists are anything but transparent.

As of January 1, 2021, hospitals are now required to release pricing data for medications, labs, and services in the form of a chargemaster list, in an effort to make hospital prices more shoppable. But instead of improving transparency, these chargemaster prices are riddled with data issues, are unapproachable for patients, and only really highlight the variable, and seemingly random nature of hospital pricing.

Recent research on these chargemaster prices illustrates some of their issues. A Bernstein analysis of hospital prices for more than 15 specialty drugs observed a markup 2.5 times higher compared to the average sales price (ASP). And research from Pharmaceutical Research and Manufacturers of America found that hospitals received payments from commercial health plans that were nearly 2.5 times greater than the amount the hospital paid to acquire the medication. However, these analyses are all focused on notoriously expensive specialty medications.

Our team here at GoodRx wanted to compare chargemaster prices to something more tangible—pharmacy cash prices for commonly filled medications. These cash prices, also referred to as the average retail prices, are readily available, and provide a good benchmark for a “fair” price a consumer should pay. But according to our research, in a hospital setting, things aren’t always fair.

After months of parsing the chargemaster data, it’s clear that new legislation aimed at improving transparency may only be a bandaid on a gaping issue within healthcare pricing, and patients, especially the most financially vulnerable, may still be left in the dark.

# OUR FIVE KEY FINDINGS

The below report details our findings on prices for 16 hospitals' chargemasters for 12 common drugs. Among our key findings:

- 01** Charges for routine generic drugs are expensive and vary hospital to hospital.
- 02** Hospital chargemasters price common generic medications as much as 6,000% higher than the average retail price at pharmacies nationwide.
- 03** Many hospitals are still not adhering to CMS rules.
- 04** Data issues abound, hurting transparency and ultimately consumers.
- 05** Data and policy changes are necessary for consumers to benefit from the ruling.

# HOW DOES HOSPITAL PRICING WORK, AND HOW IS THE NEW RULE SUPPOSED TO HELP WITH TRANSPARENCY?

On January 1, 2021, all hospitals were officially required to publish pricing information for all drugs and services, in an effort to provide transparency to consumers. These prices, which were once hidden in hospital bills and guarded as industry secrets, are now available to the public to view and use as a pricing shopping tool.

However, according to our research, in the confusing world of hospital pricing, instead of helping consumers, these price lists are largely inaccessible and provide incomplete information for price shopping. What's more, when we were able to compare hospital prices, we unearthed evidence of variable pricing tactics that are still gouging consumers, even on routine generic medications.

Below, we walk through how hospital pricing works, what a chargemaster is, and what the ruling was intended to achieve.

## Hospital pricing 101

Hospitals consistently deal with a complicated balance of serving patients, while still making enough profit to keep doors open. This push and pull between doctors, patients, insurers, plans, and government regulations creates a complex pricing and billing ecosystem that is challenging for consumers to navigate. As such, it is also a system that lacks transparency, in many cases at the expense of patients.

Hospital prices are listed in a charge description master, more commonly referred to as chargemaster. These chargemaster lists are hospital-specific, and are used as the starting point for billing to both patients and insurers. What's more, hospitals use these lists to negotiate reimbursement rates with payers, and hospitals often set higher charges in order to negotiate higher reimbursement rates.

As a result, prices listed in a chargemaster rarely reflect actual costs. In fact, according to research from Health Affairs, chargemaster prices are typically three times higher than actual hospital costs.

## How chargemaster prices affect patients

Because of these pricing tactics, many argue that these chargemaster prices are insignificant, and few pay prices that are listed. This isn't completely wrong — health insurance can insulate many Americans from these high costs. But what about those patients that are uninsured, or have a high deductible health plan, or even happen to be admitted to a hospital or treated by a provider that is out of network? Those patients, who also tend to be the most financially vulnerable, will likely face the prices detailed on the chargemaster.

### Chargemaster prices for uninsured patients

There are currently 40 million underinsured patients in the United States. As some of the most financially vulnerable with regards to a hospital or emergency room visit, chargemaster prices matter.

When an uninsured patient visits the hospital or emergency room, they will likely be billed the gross charges — the prices detailed on the chargemaster. While discounts are available for uninsured patients, these discounts are based off of the gross charge detailed in the chargemaster. So is a discount off an egregiously priced service or medication really a discount at all?

According to the [Kaiser Family Foundation \(KFF\)](#), hospitals sometimes charge uninsured patients two to four times more than what insurers actually pay for a hospital service. A piece from 2017 [featured](#) in The New York Times highlights this disconnect. A patient, Wanda Wickizer, was billed \$286,000 for inpatient treatment for a brain hemorrhage, even after a 20% negotiated “uninsured discount.” Medicare, instead, would have paid less than \$100,000 for her treatment.

## Chargemaster prices and out-of-network services

What happens to those patients that visit an out-of-network provider or hospital? They will often pay the chargemaster price as well, and out-of-network services happen more than you might think. According to research from [KFF](#), 18% of emergency visits and 16% of in-network stays in 2017 had at least one out-of-network charge. And this number differs by state. In Texas, 35% of emergency visits resulted in an out-of-network charge, while in Nebraska, only 5% of visits resulted in the charge.

In many cases, these bills are out of a patient’s control, as they may need to visit an emergency room that isn’t contracted with their insurance, or see a provider that is out of network. What’s more, these bills are often a surprise to patients. With insurance coverage, many expect to be shielded from the high hospital charges, but in fact, they could receive a bill consisting of the high chargemaster prices for out-of-network services.

So what does this all mean? Chargemaster prices, while seemingly nonsensical, are very impactful. Yes, many Americans will only pay a small part of a chargemaster fee, but many, and especially those that are the most vulnerable, could be hit with the highest prices.

## What hospitals are required to provide under the price transparency ruling

In an attempt to increase healthcare transparency for American consumers, the Centers for Medicare & Medicaid Services (CMS) authorized a final rule requiring hospitals to publically provide the standard prices for the items and services they offer. This rule was designed to give consumers greater access to information about the cost of care at different hospitals and thus the ability to compare prices across hospitals — and hopefully avoid large bills.

The CMS final rule went into effect on January 1, 2021 and requires hospitals to (1) post a machine-readable file with the prices of all items and services and also (2) provide a consumer-friendly display of 300 common shoppable services. Shoppable services are defined in the final rule as services that can be scheduled by a healthcare consumer in advance.

According to CMS, the machine-readable data must have:

- A plain language description of each shoppable service
- A description of charges including:
  - Gross charge, or the charge absent any discounts
  - Discounted cash price, or the price a patient would pay without insurance
  - Payer-specific negotiated charge, or the price a third-party payer such as a health insurance company would pay
  - De-identified maximum and minimum negotiated charge, or the range of prices a third-party payer would pay
- Any primary code used by the hospital for purposes of accounting or billing

This machine-readable file must cover every item or service that could be provided by the hospital to a patient in both inpatient and outpatient scenarios. In addition, the file must be displayed prominently on a publicly available website and be accessible without any charge or need for consumer information.

In contrast with the requirements for the machine-readable file, the required consumer-friendly display does not need to show prices for every item and service. Instead, CMS requires hospitals to provide the prices for 70 CMS-specified shoppable services and an additional 230 services that are at the hospital's discretion. Per the CMS ruling, the hospital must provide (1) the payer-specific negotiated charge, (2) the discounted cash price, and (3) the de-identified minimum and maximum charge for each shoppable service. Similar to the machine-readable file, this consumer-friendly display of services must be publicly available without any barriers to access.

Hospitals that do not comply with these requirements could face a written warning notice, and a request for a corrective action plan. If the hospital does not respond to this request, they can be penalized by CMS with a \$300 per day fine. In order to monitor compliance with the hospital price transparency rule, CMS is currently conducting an audit of a sample of hospitals across the U.S.

So how well has the rule worked so far? Next, we'll look at our findings on how the rule has played out when it comes to generic drug pricing at hospitals.

# HOSPITAL CHARGEMASTER DATA REVEALS THAT ROUTINE GENERIC DRUGS ARE EXPENSIVE AND VARY HOSPITAL TO HOSPITAL

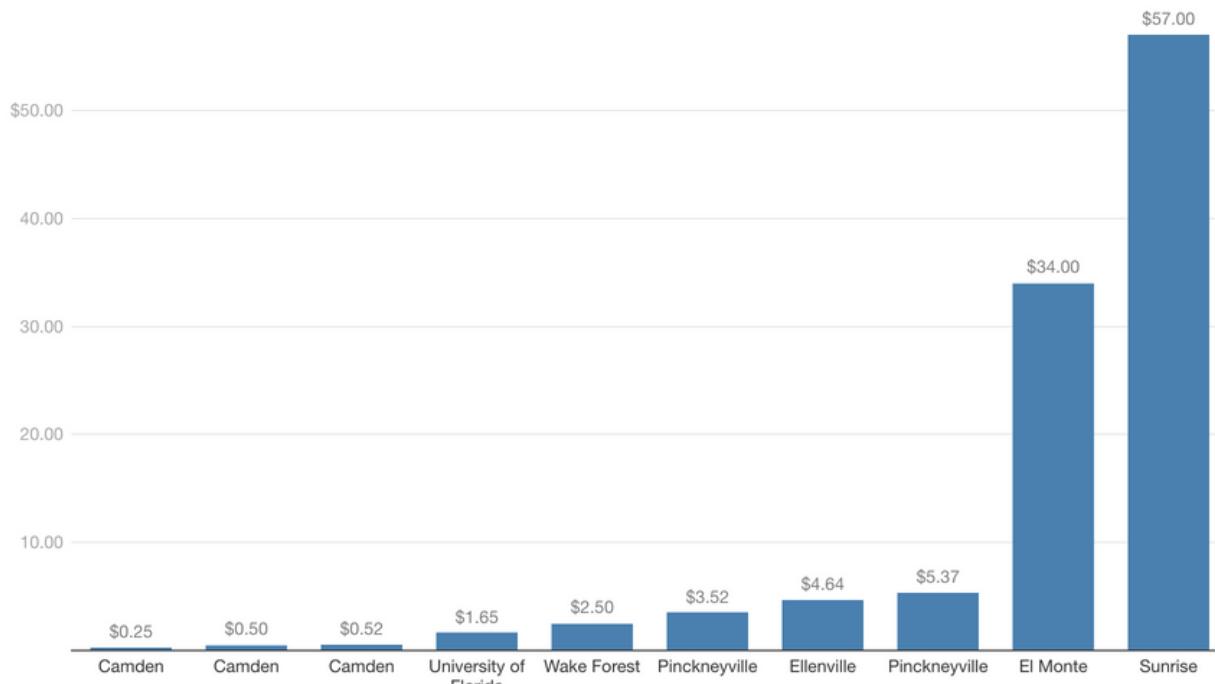
In an interview with Kaiser Health News, Gerard Anderson, director of the Johns Hopkins Center for Hospital Finance and Management, stated, “Posting [hospital charges] publicly could make hospitals totally embarrassed by the prices.” And it’s true.

According to our research on just 10 popular generic drugs, hospital chargemaster prices vary to an embarrassing degree — by more than \$50 per tablet or capsule in some cases.

Take one 50 mg tablet of sertraline, the generic for Zoloft, a popular medication used to treat depression, obsessive-compulsive disorder, post-traumatic stress disorder, and more. Sunrise Hospital in Las Vegas charges \$57 per pill (note that Sunrise only lists the undiscounted cash price), while Camden Hospital in West Virginia lists three different prices all around about \$0.50 per pill.

## The Spread in Hospital Chargemaster Prices: Sertraline Price Per Pill

Price per sertraline 50 mg tablet



Note: Camden and Pinckneyville list two prices for the same medication.

Source: GoodRx

GoodRx

Similar trends exist for nearly all drugs included in this analysis — at one hospital, chargemasters list a medication for close to pennies, while another hospital just a state away could charge close to \$50 per pill.

Lisinopril, used to treat high blood pressure and heart failure, is another example of wildly variable chargemaster pricing. Camden Hospital and Albany Memorial Hospital in New York list a lisinopril pill for about \$0.40 (Camden lists two prices for lisinopril), while El Monte Hospital lists a price of \$19.00 per tablet and Sunrise lists a price of \$43.00 per tablet.

#### The Spread in Hospital Chargemaster Prices: Lisinopril Price Per Pill

Price per lisinopril 20 mg tablet



Note: Camden and Pinckneyville list two prices for the same medication.



Remember, this is the price for one tablet, which can quickly add up. At Sunrise Hospital, if a patient were to be admitted to the hospital for 4.3 days, the average length of admission, they could face nearly a \$200 charge for just four tablets, whereas a patient at Albany Memorial Hospital would face about \$2.

We know what you're thinking — no one pays these prices. But as we discussed above, many uninsured patients, and those visiting an out-of-network hospital or provider, could very well face these prices, likely in the form of a surprise medical bill.

El Monte Hospital, which has generally high chargemaster prices for most common generics, is located in California, a state where nearly 35% of all emergency visits result in at least one out-of-network charge. As such, more admitted patients could find themselves paying totally out of pocket for the drugs and services required during their visit. On top of that, nearly 10% of the population in Los Angeles County, where El Monte Hospital is located, lacks insurance.

Other hospitals reside in areas with an even greater proportion of uninsured individuals. Two hospitals in Texas included in the analysis, Baylor and Las Palmas, reside in counties with uninsured rates hovering around 20%. Meaning nearly a quarter of the population will be paying completely out of pocket for their hospital visits.

Again, while chargemaster prices may not be important to all patients, some, no matter their insurance coverage, may find themselves paying the prices listed in hospital chargemasters.

These prices seem even more striking when compared to pharmacy cash prices, described in detail below.

# HOSPITAL CHARGEMASTER PRICES FOR GENERIC DRUGS CAN BE ALMOST 6,000% HIGHER THAN THE AVERAGE CASH PRICE AT PHARMACIES NATIONWIDE

Generic medications have long been touted as a way for patients to save on their medications. And for good reason. In pharmacies, generic medications typically cost about 80% to 85% less than the brand name alternative, and some can cost pennies per tablet, even without insurance. But according to hospital chargemasters, generics may not be as affordable in an inpatient or emergency room setting, even if they are the same medications dispensed in the pharmacy.

Average hospital markup over pharmacy retail price can vary widely. In fact, for a basket of commonly prescribed generic drugs, the price at hospitals can reach as high as nearly 6,000% over the average retail price at pharmacies, but can also be as low as 44% cheaper than the retail cash price.

## Average Hospital Chargemaster Markup Compared to Average Retail Price at Pharmacies Nationwide

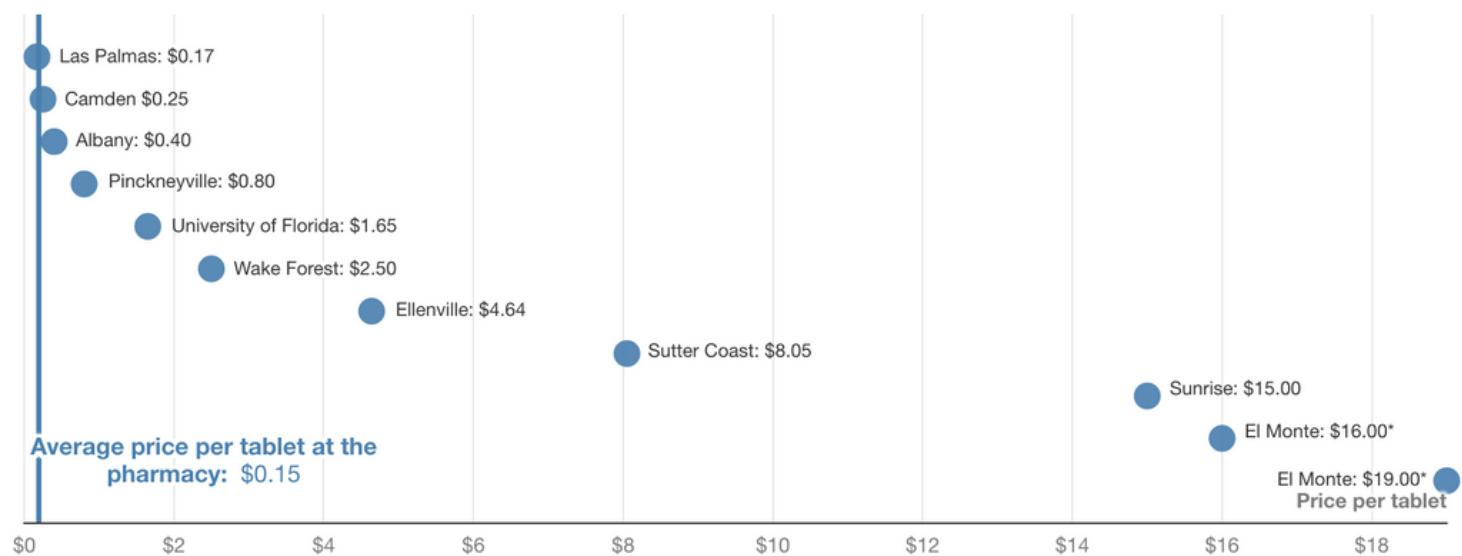
Hospital	Average markup
Sunrise	5991.1%
El Monte	3843.9%
Sutter Coast	2119.5%
Ellenville	941.7%
Wake Forest	461.3%
Pinckneyville	439.1%
Albany	-6.2%
Camden	-43.9%

Average markups are based on chargemaster prices for 6 drugs at 8 hospitals across the country. Drugs included in this analysis are: aspirin tablet 325 mg, losartan tablet 25 mg, gabapentin capsule 100 mg, amoxicillin capsule 250 mg, atorvastatin tablet 10 mg, and lisinopril tablet 20 mg.

Take aspirin, which has an average retail price of \$0.15 per tablet in pharmacies nationwide, meaning that a monthly supply would only cost consumers about \$4.50. However, in hospitals, the average cash price in our sample is about \$6.00 per tablet, costing as little as \$0.17 to as much as \$19 per tablet depending on the hospital.

### Cash Price Per 325 mg Aspirin Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



\*Note: El Monte lists two different prices for aspirin 325 mg.

Source: GoodRx

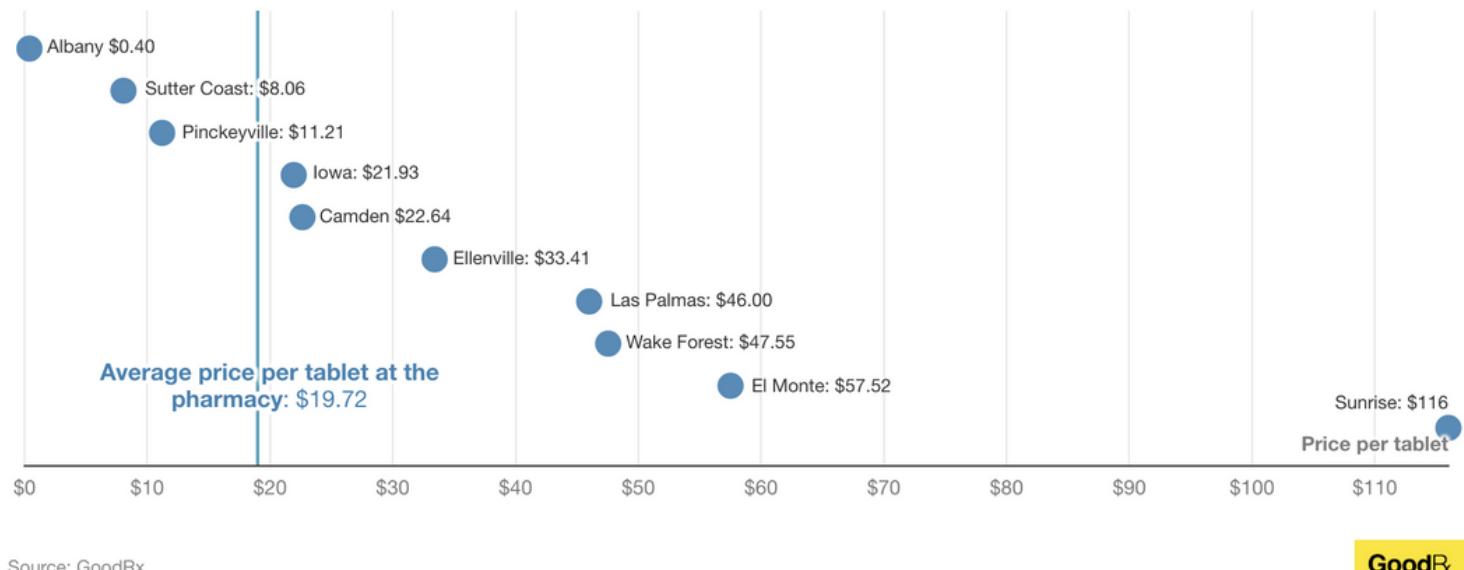


Similar trends also exist for more expensive brand name drugs that typically have higher prices in a pharmacy setting. Xarelto, for instance, used to treat and reduce the risk of blood clots, costs about \$20 per 10 mg tablet in pharmacies. That adds up to about \$600 for a 30-day supply. Expensive, yes, but hospital prices are even higher.

The average cash price (both discounted and undiscounted) in a hospital setting for one 10 mg Xarelto tablet is \$36, and can range from \$0.40 per tablet to \$116.

## Cash Price Per 10 mg Xarelto Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



Source: GoodRx



Hospitals typically don't allow patients to bring in their own medications. So for the many Americans that take chronic medications, an inpatient visit will likely require them to switch to the hospital's supply of the same medication. And while this is important to ensure patient safety, it can be bad for patients' wallets, and costs can quickly add up.

At El Monte hospital, for instance, a patient could find themselves paying \$19.00 per aspirin tablet, which is nearly 130 times what they would have paid for one tablet in the pharmacy, and five times what they would have paid for 30 tablets.

See the breakdown between hospital chargemaster prices compared to pharmacy prices for all 12 drugs at the 16 hospitals we observed in Appendix A below.

# HOSPITAL CHARGEMASTERS ARE PLAGUED WITH DATA PROBLEMS

It's clear that data issues abound, and the new ruling to release chargemaster information may be too riddled with problems to be helpful to consumers, or even researchers.

Chargemaster data includes hundreds of thousands of rows of cryptic codes, hard to understand drug names, duplicate data, and more. For a consumer looking to price a drug or service, they will need to scour through these complicated documents, identify their correct CPT code or National Drug Code (NDC), and identify the price for their unique situation. And on top of that, the price they find may not actually be the price they are quoted at the hospital. It makes us wonder, is sharing bad data better than sharing no data at all?

Below, we dive into the many ways in which data constraints hinder price shopping and ultimately saving for patients, and make it difficult for researchers, plan sponsors, and employers to make sense of the information.

## Failure to follow Medicare ruling guidelines

As we mentioned above, according to the new CMS ruling, hospitals are required to list the following in their chargemaster data:

- A plain-language description of each shoppable service
- A description of charges including:
  - Payer-specific negotiated charge, or the price a third-party payer such as a health insurance company would pay
  - Discounted cash price, or the price a patient would pay without insurance.
  - Gross charge, or the charge absent any discounts
  - De-identified maximum and minimum negotiated charge
- Any primary code used by the hospital for purposes of accounting or billing

At present, the penalty for non-compliance with the rule is a \$300 per day fine, and it's clear that that amount may not be enough to pressure change.

According to our research, of the 16 hospitals we investigated, only 6 adhered to CMS guidelines.

### Do Hospital Chargemasters Adhere to CMS Regulations?

No Ambiguous Yes

	Gross charge	De-identified maximum payer negotiated charge	De-identified minimum payer negotiated charge	Discounted cash price	Payer-specific negotiated charge	Drug charges
University of Florida Health	Ambiguous			Ambiguous		
Wake Forest Baptist Health	Yes					
Asante Rogue Regional Medical Center	Yes					
Baylor Scott & White Medical Center – Uptown	Yes					
Albany Medical Center Hospital	Yes			Ambiguous		
University of Iowa Hospital	No	No	No	Ambiguous	No	
Sutter Coast Hospital	Yes					
New York Presbyterian Hospital	Yes	Ambiguous	Ambiguous	Yes		No
Las Palmas Medical Center	Yes	Ambiguous	Ambiguous	Ambiguous		
Sunrise Hospital and Medical Center	Yes	Ambiguous	Ambiguous	Ambiguous		
Beaumont Hospital, Farmington Hills	Ambiguous	Yes	Yes	Ambiguous		
Camden Clark Memorial Hospital	Yes			Ambiguous		
Berkshire Medical Center	Ambiguous	Yes	Yes	Ambiguous		
Ellenville Regional Hospital	Yes					
Pinckneyville Community Hospital	Yes					
Greater El Monte Community Hospital	Ambiguous	No	No	Ambiguous	No	

As shown in the table above, Wake Forest, Asante, Baylor, Sutter Coast, Ellenville, and Pinckneyville are the only surveyed hospitals that share their chargemaster data in full accordance with CMS guidelines. And while many hospitals may disclose data that are in accordance with CMS rules, they do not do so in a way that is understandable to consumers or even researchers, hence the “ambiguous” cells in the table above.

For example, hospitals are required to list the “discounted cash price” for drugs and services. This discounted price is what someone would pay without insurance. However, terms like “undiscounted cash price” (Las Palmas, Sunrise), “uninsured” (Beaumont), “uninsured cash price” (Camden), “self-pay” (Berkshire), or “item price” (El Monte) are used across chargemasters. Because there is no data dictionary to confirm or deny what data field corresponds to “Discounted cash price” as required by CMS, researchers and consumers have to make a best guess at which column to compare to make apples-to-apples comparisons across chargemasters.

Payer-negotiated rates are also not properly listed in many chargemaster datasets. This price is the price a third-party payer, such as a health insurance company, would pay, and hospitals are required to list both the minimum and maximum charge. Two hospitals failed to show any payer-negotiated rates at all, while others only list a few insurers.

These are just some of the many ways that current chargemaster data are not in line with CMS rules. You can see a detailed breakdown of notes on each hospital in Appendix B1 below.

## Sloppy data practices

In addition to lack of adherence to CMS rules, chargemaster datasets are often riddled with other issues that make it even more difficult to understand or research hospital prices. These complications make it hard to use the machine-readable file to identify the correct charges as a consumer, as a researcher, and as a company attempting to build a consumer-friendly product to display the data. As our team cleaned the hospital chargemaster data, we found that hospitals often used bad data practices in their machine-readable file.

Of the hospitals we observed, none adhered to “good” data practices, making the data unuseable to consumers and others.

### Do Hospital Chargemasters Follow Consumer-Friendly Data Practices?

No Ambiguous Yes N/A

	Provides a data dictionary	One table per file	All columns labeled	Does not contain duplicate rows	Contains only numerical values for price data fields	Contains unit and quantity of measurement	Contains NDCs
University of Florida Health	No	Yes	Yes	Yes	No	No	No
Wake Forest Baptist Health	No	Yes	Yes	No	Yes	No	No
Asante Rogue Regional Medical Center	No	Yes	Yes	Yes	Yes	Yes	Yes
Baylor Scott & White Medical Center – Uptown	No	N/A	Yes	No	Yes	No	No
Albany Medical Center Hospital	No	No	No	No	No	Ambiguous	No
University of Iowa Hospital	No	Yes	Yes	Yes	No	No	Yes
Sutter Coast Hospital	No	Yes	Yes	Yes	Yes	No	Yes
New York Presbyterian Hospital	No	Yes	Yes	Yes	No	No	No
Las Palmas Medical Center	No	No	Yes	Yes	No	No	No
Sunrise Hospital and Medical Center	No	No	Yes	Yes	No	No	No
Beaumont Hospital, Farmington Hills	No	Yes	Yes	No	Yes	No	Yes
Camden Clark Memorial Hospital	No	No	Yes	Yes	Yes	No	Yes
Berkshire Medical Center	No	No	Yes	No	No	No	No
Ellenville Regional Hospital	No	Yes	Yes	Yes	Yes	No	Yes
Pinckneyville Community Hospital	No	No	Yes	Yes	Yes	No	No
Greater El Monte Community Hospital	No	Yes	Yes	Yes	Yes	No	No

\*See methodology for description of column requirements

Source: GoodRx

For example, Albany provides a chargemaster in a comma-separated values (CSV) file format, with two differently formatted tables in one file, making it easy to miss the second table and to read it into a programming software for research purposes. What's more, the second table does not have any column labels, therefore it is impossible to know, for certain, what the data fields represent. At best, both researchers and consumers will have to guess at how to interpret the data. Hiding a second table in a file is not uncommon, either — in fact, six hospitals in total have more than one separate table in one file. There is no indication anywhere that there are two tables in a file without careful inspection of the entire file.

## Changes that could make price shopping easier for patients

What do these prices, and the new CMS legislation, mean for consumers? Sharing chargemaster data, with the hopes of improving transparency, is a noble cause. But does transparency with regards to hospital pricing actually benefit consumers, or help them “shop around”? In reality, probably not.

In the pharmacy world, transparency can empower consumers. For most, especially those living in a more populated city, there are multiple pharmacies to choose from to find the best price. But that's just not the case for hospitals. For many patients visiting an emergency room, there is no time to sift through chargemaster data to find the one that has the lowest prices.

As such, these chargemaster lists may only be useful in a research or product setting. As they are set up now, they are unavailable to consumers, and likely could cause some to forgo treatment when they see the high prices listed.

So, while transparency, especially in the healthcare space, is always beneficial, this new policy has many hurdles to overcome before consumers may actually feel the benefits. Serious overhaul needs to be taken into consideration in order for said ruling to be fully functional and impactful.

Below are some improvements we recommend.

## 1) Use more standardized data files

At present, CMS provides no template outlining how hospitals should display their chargemaster data. This makes it hard for researchers, product developers, and consumers to compare price sheets, shop around, or even build additional ways for patients to save. CMS should develop a template for hospitals to use as well as further detail terminology that hospitals are required to use in their chargemaster data, and explain how this data should be laid out.

While this may create a heavy lift for hospitals as they create their price sheets, it could help researchers, consumers, product developers, and others to easily compare prices, shop around, and save.

## 2) Develop a data dictionary

At present, few hospitals provide any documentation for their chargemaster files. With multiple columns, and sometimes thousands of rows, providing a document without any context doesn't set patients up for success.

Take the University of Florida. Patients looking to price a certain medication or service will have to sift through 60 different columns, all with different prices or payers. The columns have perplexing names like "Std Price," "CMS PED I CARE HMO," "MDA," "MULTIPLAN," "Uninsured," "Pricing Min," and "Pricing Max." In the pricing data specifically, some cells are left blank, some have prices of "0," and some note that the price is "bundled." Without a proper description of each term, how are researchers, let alone patients, supposed to navigate the data?

To solve this issue, hospitals should also be required to release a data dictionary detailing what different terms mean and how prices are calculated, and explain any missing data.

### 3) Offer more robust insurance information

While many hospitals do provide insurance pricing information, it's almost impossible to identify the exact plan they are referring to. Albany, for instance, lists prices for just "United Healthcare Commercial OP," "United Healthcare Commercial IP," "PHCS," "HRGi," "Excellus - RMSCO," and "Beech Street." With the many different insurers and plans, patients have no way to distinguish what price they may pay under their specific insurance.

As such, for payer negotiated prices, hospitals should be required to provide the full plan name and the plan effective date, and add an additional field identifying whether plans are government or private insurance. This additional context could help to ensure that patients are able to reference their correct price.

### 4) Detail more specific drug information

For many of the hospitals, drug information was lacking, to the point where it was difficult to identify exactly what drug a price was related to.

In the data from Pinckneyville Community Hospital, for example, it was difficult to identify the number of tablets they were pricing. For instance, the cash price for "METFORMIN 1000MG TABLETS" was \$3.28, whereas the cash price for "METFORMIN 1000MG TABLET" was \$4.36. Without any information about the quantity, or even an National Drug Code (NDC), it's impossible to know the quantity that is being priced.

Similarly, it was difficult to know if a brand, or the generic, was being priced. In the Pinckneyville data, they listed different prices for "ATORVASTATIN 10MG (LIPITOR) TAB," "ATORVASTATIN 10MG TABLET," and "LIPITOR(ATORVASTATIN)10MG: TAB," all with different prices.

Finally, without proper drug and dosing information, pricing anything but a tablet or a capsule requires some serious sleuthing. In nearly every chargemaster dataset, epinephrine was listed in a way that was nearly unidentifiable. For instance, the same medication was listed as “EPINEPHRINE HCL 100 MCG/10 ML(10 MCG/ML) IN 0.9 % SOD CHLOR IV SYRINGE,” “EPINEPHRINE (JR) 0.15 MG/0.3 ML INJECTION,AUTO-INJECTOR,” “EPINEPHRINE 0.15 MG/0.3 ML IJ ATIN2 each,” and “EPINEPHRINE 1 MG/ML IJ SOLN30 mL.” Few chargemasters noted the quantity priced, or the form (vial, auto-injector) in a way that was understandable to consumers.

As such, chargemaster data should spell drug information out in a more consumer-friendly way, and should note the exact quantity and units (tablets, capsules, vials, mL, etc), and brand or generic status. On top of that, chargemasters could even detail the NDC, which can further help researchers, and some more drug-savvy consumers, identify the exact drug, form, and quantity that is being referenced.

## 5) Implement data checks to remove duplicate prices

As shown in many of the charts above, some hospitals list different prices for the same drug. For instance, the El Monte chargemaster lists two different prices for one tablet of aspirin 352 mg — one price of \$16.00, and one price of \$19.00. And confusingly, the item description is labeled “ASPIRIN TAB : 325MG” and “EC ASPIRIN (ECOTRIN) TAB : 325MG,” respectively, even though it is the same drug.

Pinckneyville chargemaster data has similar issues. For instance, their chargemaster data file lists two different prices for one tablet of 40 mg atorvastatin: \$9.78 per tablet, and \$9.49 per tablet.

Additional data checks could ensure that duplicates are removed, making the data more useful in identifying the correct item and service.

## SUMMING IT ALL UP

From the pharmacy, to the doctor's office, to the hospital, consumers continue to shoulder the weight of high healthcare costs, and legislation aiming to help continues to fall short.

Our research above on hospital chargemaster data highlights how legislation aimed at benefiting patients is unfortunately rife with challenges and may only work to shed light on how outrageous hospital pricing can be. Don't get us wrong — transparency is good for consumers. But the new CMS legislation will likely still leave many, especially the most vulnerable, shouldering high costs.

# METHODOLOGY

## 1) Data collection

We collected hospital chargemaster data from 16 hospitals across the U.S. We chose hospitals based on existing research demonstrating hospital drug price variation and by selection to include a variety of geographic areas. We first systematically cleaned each chargemaster into a standard format. We then identified drugs by item or service description, broadly filtering for drugs by the name and ingredient (see table below), then filtering for the cash price. The following list shows the included hospitals, the data values we selected to define cash price for each hospital, and the chargemaster effective date.

- University of Florida Health Shands (1/1/2021): Uninsured
- Wake Forest Baptist Health (1/1/2021): Discounted Cash Price
- Asante Rogue Regional Medical Center (1/1/2021): Discounted Self-Pay
- Baylor Scott & White Medical Center – Uptown (3/8/2021)\*: Discounted Cash Price
- Albany Medical Center Hospital (1/1/2021): Cash Price
- University of Iowa Hospital (12/1/2020): Uninsured Cash Rate - Inpatient, Uninsured Cash Rate - Outpatient
- Sutter Coast Hospital (12/10/2020): Discounted Cash Price
- New York Presbyterian Hospital (2/26/2021): Discounted Cash Price
- Las Palmas Medical Center (1/4/2021): Undiscounted Cash Price
- Sunrise Hospital and Medical Center (1/4/2021): Undiscounted Cash Price
- Beaumont Hospital, Farmington Hills (1/1/2021): Uninsured
- Camden Clark Memorial Hospital (2/17/2021): Uninsured Cash Price
- Berkshire Medical Center (1/1/2021): Self Pay
- Ellenville Regional Hospital (12/28/2020): Discounted Cash Price
- Pinckneyville Community Hospital (12/10/2020): Cash Price
- Greater El Monte Community Hospital (5/1/2021)\*: Item Price

\*For hospitals without a stated effective date, we assume the date of data download will be the effective date.

Our drug cohort includes commonly prescribed generic drugs that cover a variety of pharmacological classes and conditions.

## Drug Cohort

Drug	Keyword search terms
atorvastatin	atorvastatin
lisinopril	lisinopril
levothyroxine	levothyroxine
amlodipine	amlodipine
gabapentin	gabapentin
omeprazole	omeprazole
metformin	metformin
losartan	losartan
hydrocodone/acetaminophen	hydrocodone, acetaminophen
sertraline	sertraline
aspirin	aspirin
amoxicillin	amoxicillin
epinephrine	epinephrine
lantus	lantus, glargine
xarelto	xarelto, rivaroxaban

The GoodRx logo is a yellow rectangular button with the word "GoodRx" in white, sans-serif font, centered within it.

Note: Although our initial drug cohort includes 16 drugs, we only included a select group of drugs in the final analysis. We included drugs that appeared most consistently across hospital chargemasters.

## 2) Data cleaning

The main objective of the data cleaning was to transform the data to a format in order to compare charge prices across hospitals for an individual unit of a drug. During the data collection, we casted a wide net for inclusion of hospital chargemaster drug observations by filtering for keywords (see search terms above). In order to compare chargemaster prices across hospitals, it was necessary to both (1) remove non-included drug observations and (2) map each hospital drug observation to a standard drug formulation and dosage (see examples below). Some hospital chargemasters included a National Drug Codes (NDCs); in these instances, we identified the NDC in order to further support our removal or matching of observations.

### Example: Observation removals

We removed an observation of “METFORMIN ER 500MG TAB.” The observation was originally included because it contained our search term of ‘metformin.’ However, the extended release (ER) form of metformin is not in our drug cohort.

### Example: Observation mapping to standard drug formulation and dosage

We mapped an observation with a description of “ASPIRIN 325MG TABS” to a standard format of “aspirin tablet 325mg.”

### **Manual review process**

The removal and matching process was divided into different rounds of review. In the first round of review, five separate reviewers were assigned drug groups in order to remove observations that were drugs not in our drug cohort. The same reviewers underwent a second round of review to match each observation to a specific drug formulation and dosage.

Any uncertain matches were resolved as a group. It is possible to map two different observations for one hospital to one drug; for example, Pinckneyville has both GABAPENTIN 600MG TAB and GABAPENTIN 600MG TABLET, which are priced the same and therefore will be mapped to a standard of gabapentin tablet 600 mg. In the final round of review, three reviewers went through the matching and assessed the price of the drug and made any quantity adjustments to get the price for an individual unit of a drug. For example, a hospital had an observation described as “ATORVASTATIN 80 MG PO TAB90 each,” and the reviewers determined that the charge price was for 90 tablets, and therefore it is necessary to divide the charge price by 90 to get the charge price for an individual unit of the drug.

### 3) Pricing analysis

Average retail cash price of a drug at pharmacies: The average retail cash price is based on a representative sample of U.S. prescription fills (not GoodRx fills) and comes from several sources, including pharmacies and insurers. The reported prices are based on average retail prices, the so-called “usual and customary” prices or retail prices at the pharmacy (not including insurance copays or coinsurance). The cash price on a fill was divided by the quantity on the claim to get a price per individual unit of a drug. All prices listed in this article are based on data from May 1, 2020 to April 30, 2021.

Hospital markup calculation: To compare the markups of common generic drugs across hospitals, we narrowed the data down to six distinct drugs deemed our “drug basket” (aspirin tablet 325 mg, losartan tablet 25 mg, gabapentin capsule 100 mg, amoxicillin capsule 250 mg, atorvastatin tablet 10 mg, lisinopril tablet 20 mg). We selected drugs that had available data and that maximized the number of hospitals in the analysis. Our final basket of drugs had data available across eight included hospitals. If an individual hospital had two different prices for the same drug, we chose the cheaper price for a more conservative estimate. For each drug, we calculated the markup as the ratio of the charge price of an individual drug unit to the average retail cash price for an individual unit. We averaged the drug markups for each hospital to roll-up the markups to the hospital-level. To convert the markup to a percent change, we took the markup ratio, subtracted it by 1 and multiplied that number by 100.

## 4) Evaluation of hospitals' adherence to CMS ruling guidelines and consumer-friendly data practices (heat maps)

We evaluated hospitals' adherence to CMS ruling guidelines and to consumer-friendly data practices by data elements and properties based on the Centers for Medicare & Medicaid Services' official regulations, machine readability, and inclusion of drug-specific data that we believe should be included in all files. Two reviewers assessed 8 hospitals each and assigned values of yes, partial inclusion or unclear, or no for each category. See Appendix B for a full list of table notes.

### Adherence to Consumer-Friendly Data Practices

Heatmap column	Criteria
Provides a data dictionary	Does the hospital website provide a data dictionary describing the contents, format, or structure of the chargemaster data?
One table per file	Does each chargemaster file only contain one set of data?
All columns labeled	Do all columns have a heading or label?
Does not contain duplicate rows	Do the raw data downloaded from the website have any duplicate values?
Contains only numerical values for price data fields	Do the data fields for the charges/prices have any non-numerical values?
Contains unit and quantity of measurement	Do the chargemasters contain a data field that displays information for both 1) the quantity of item the charge is for and 2) the unit of measurement of quantity? (For ex, does it have a column stating that the charge is 'per pill' or that the unit is 'pill' and the quantity is '1')?
Contains NDCs	Does the chargemaster have a data field that specifies the National Drug Code (NDC), the universal product identifier for a drug product?

Source: GoodRx

GoodRx

## 5. Uninsurance rate

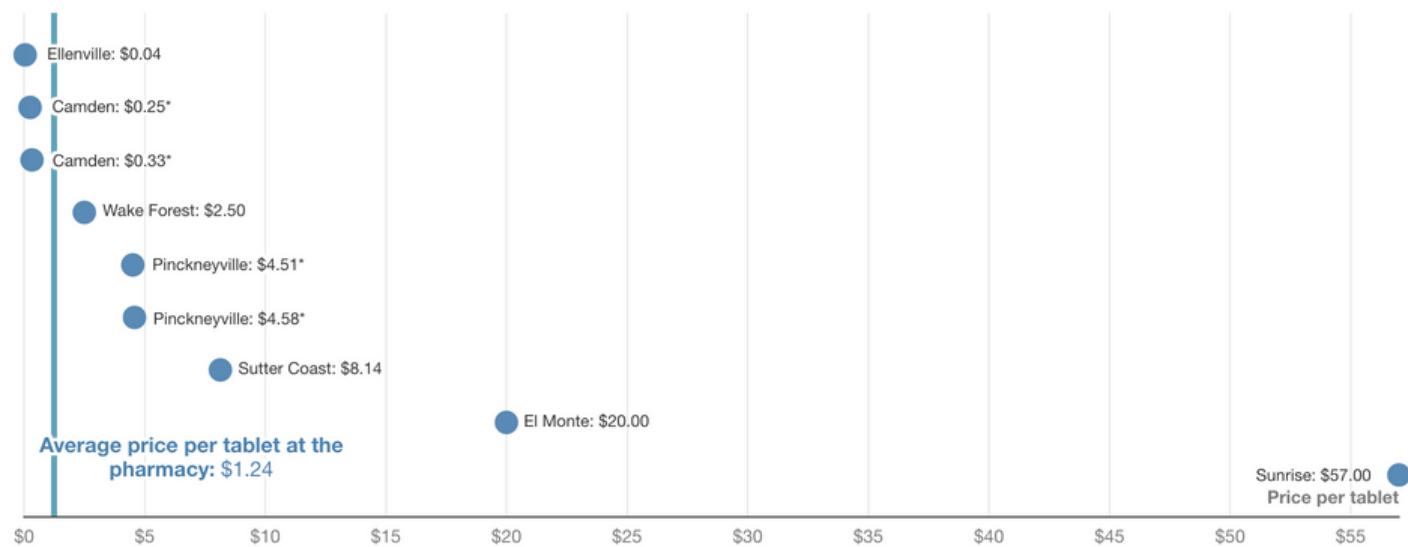
County-level uninsured rate estimates were obtained from the American Community Survey (ACS) 2019 5-year estimates (Table B27010).

# APPENDIX A

## Appendix A1: Cash price for amlodipine 5 mg tablet

### Cash Price Per 5 mg Amlodipine Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



\*Note: Pinckneyville and Camden Hospitals list two different prices for amlodipine 5 mg tablet

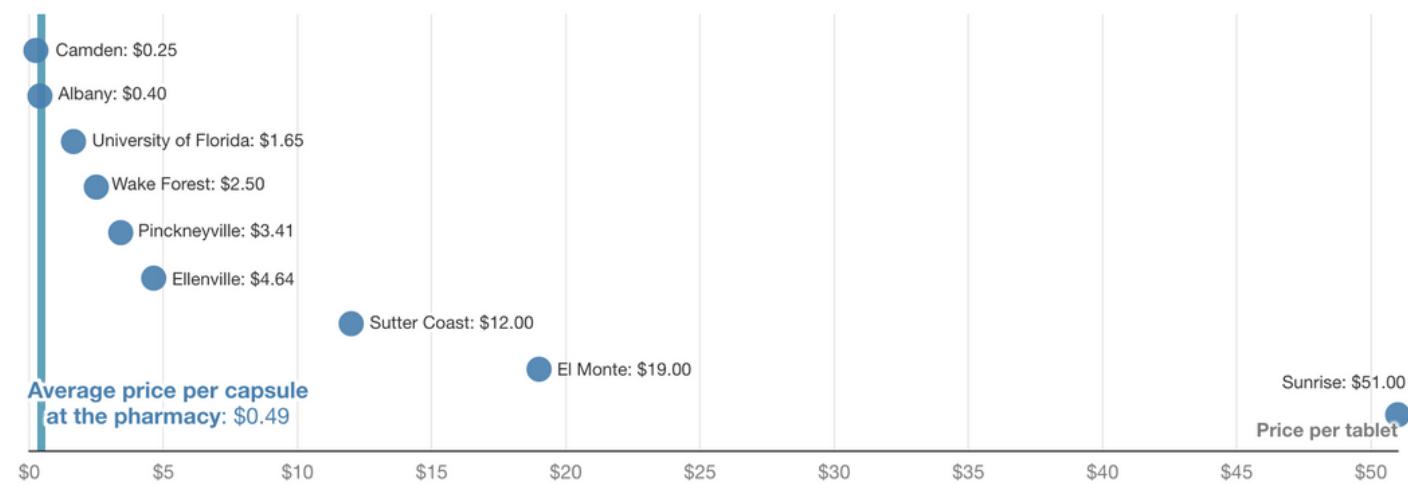
Source: GoodRx

GoodRx

## Appendix A2: Cash price for amoxicillin 250 mg capsule

### Cash Price Per 250 mg Amoxicillin Capsule

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



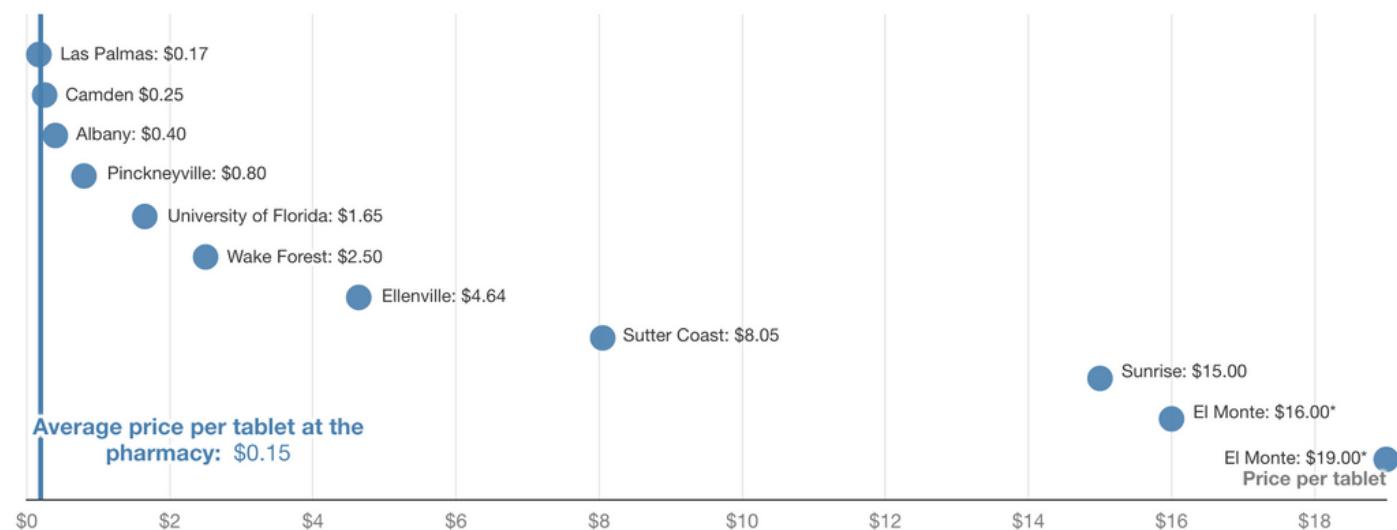
Source: GoodRx

GoodRx

## Appendix A3: Cash price for aspirin 325 mg tablet

### Cash Price Per 325 mg Aspirin Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



\*Note: El Monte lists two different prices for aspirin 325 mg.

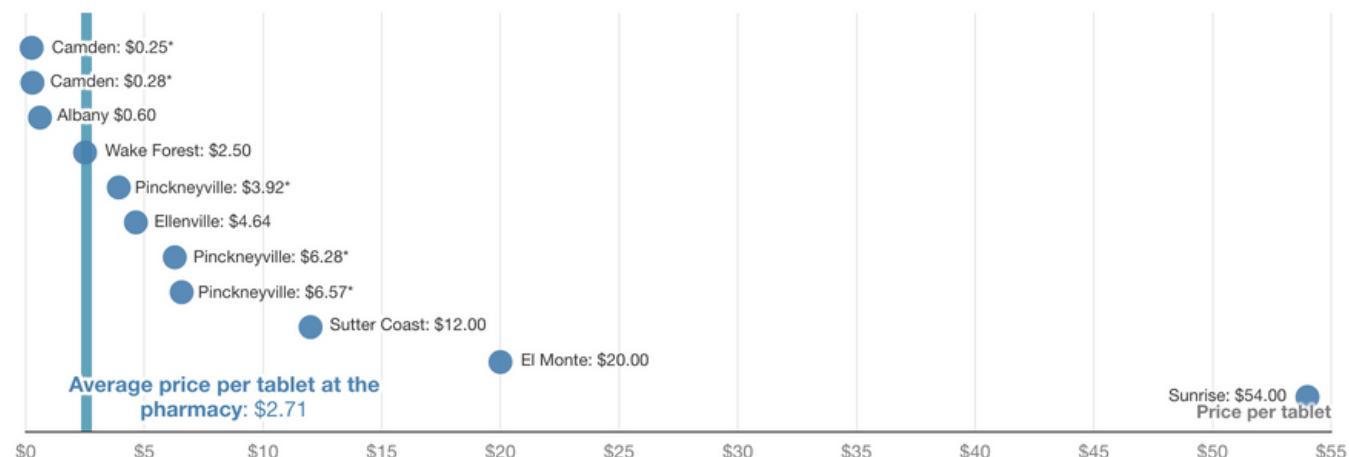
Source: GoodRx



## Appendix A4: Cash price for atorvastatin 10 mg tablet

### Cash Price Per 10 mg Atorvastatin Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



\*Note: Camden and Pinckneyville list multiple prices for atorvastatin 10 mg

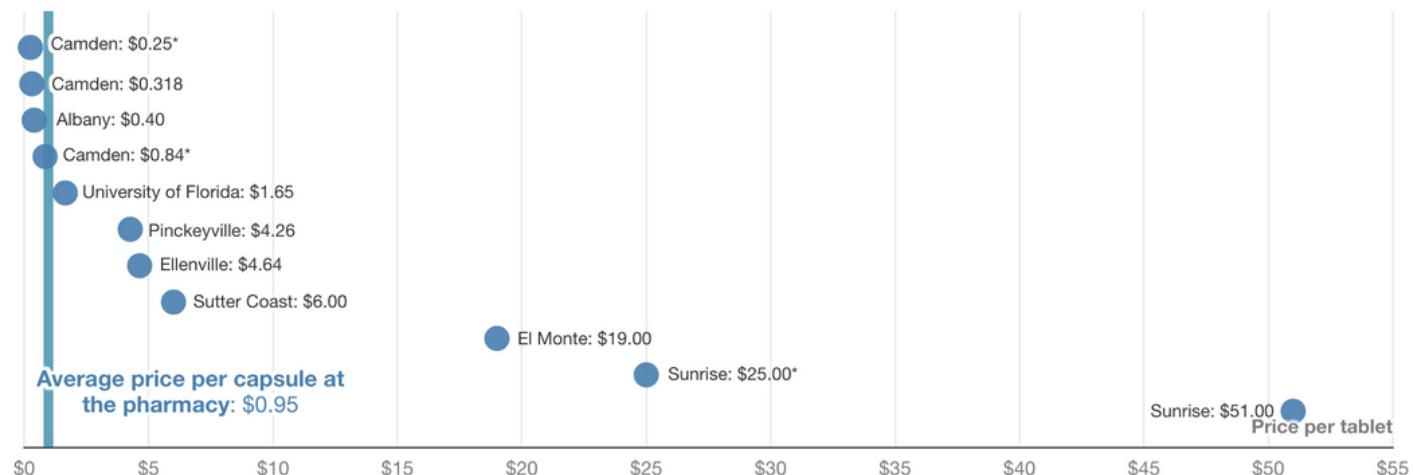
Source: GoodRx



## Appendix A5: Cash price for gabapentin 300 mg capsule

### Cash Price Per 300 mg Gabapentin Capsule

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



\*Note: Camden and Sunrise hospitals list two prices for gabapentin 300 mg

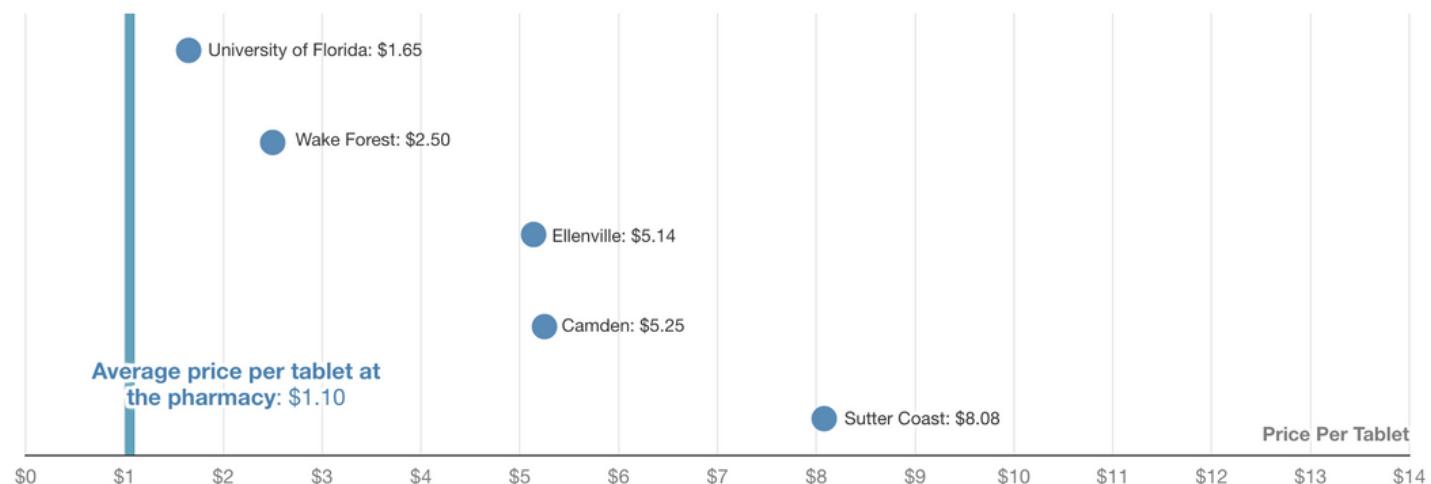
Source: GoodRx



## Appendix A6: Cash price for hydrocodone/acetaminophen 5 mg/325 mg tablet

### Cash Price Per 5 mg/325 mg Hydrocodone/Acetaminophen Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



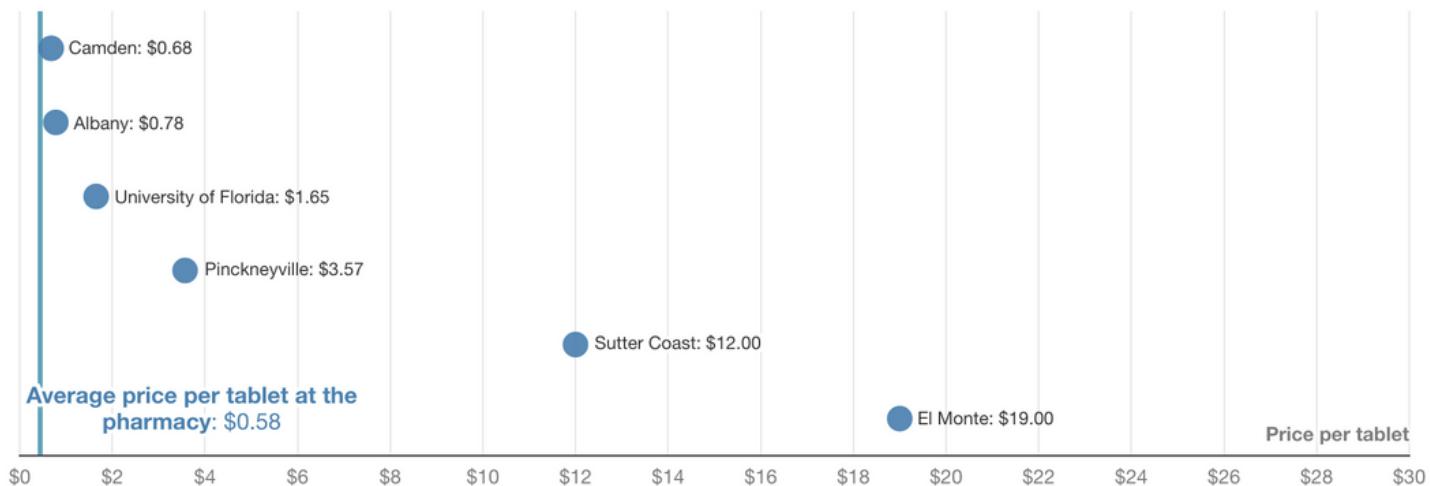
Source: GoodRx



## Appendix A7: Cash price for levothyroxine 125 mcg tablet

### Cash Price Per 125 mcg Levothyroxine Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



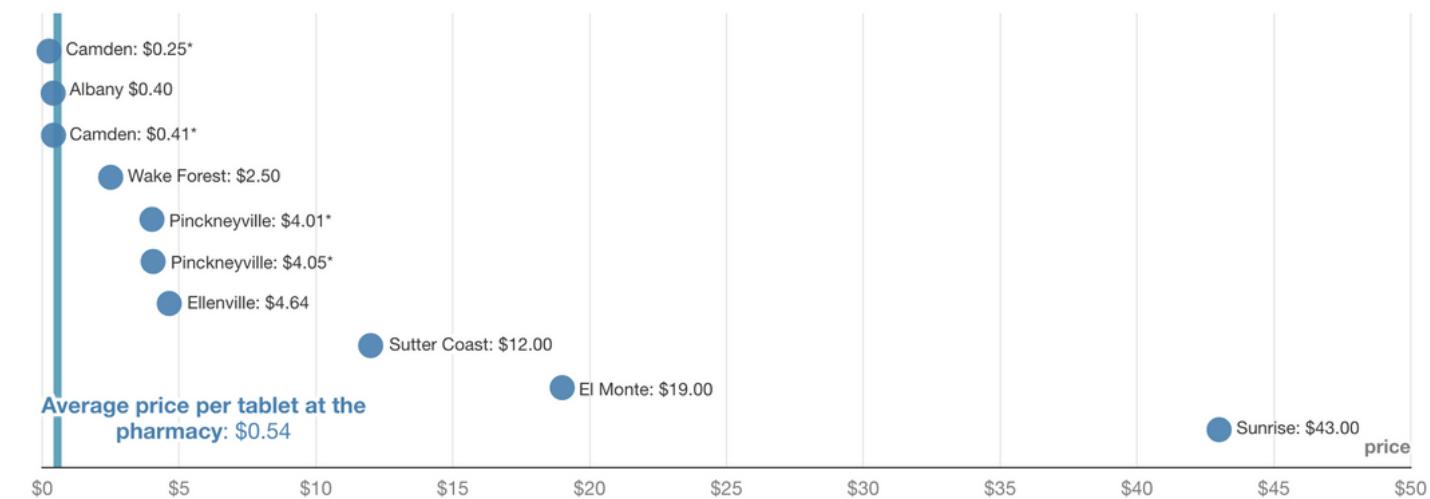
Source: GoodRx

GoodRx

## Appendix A8: Cash price for lisinopril 20 mg tablet

### Cash Price Per 20 mg Lisinopril Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



\* Camden and Pinckneyville list two prices for lisinopril 20 mg tablet

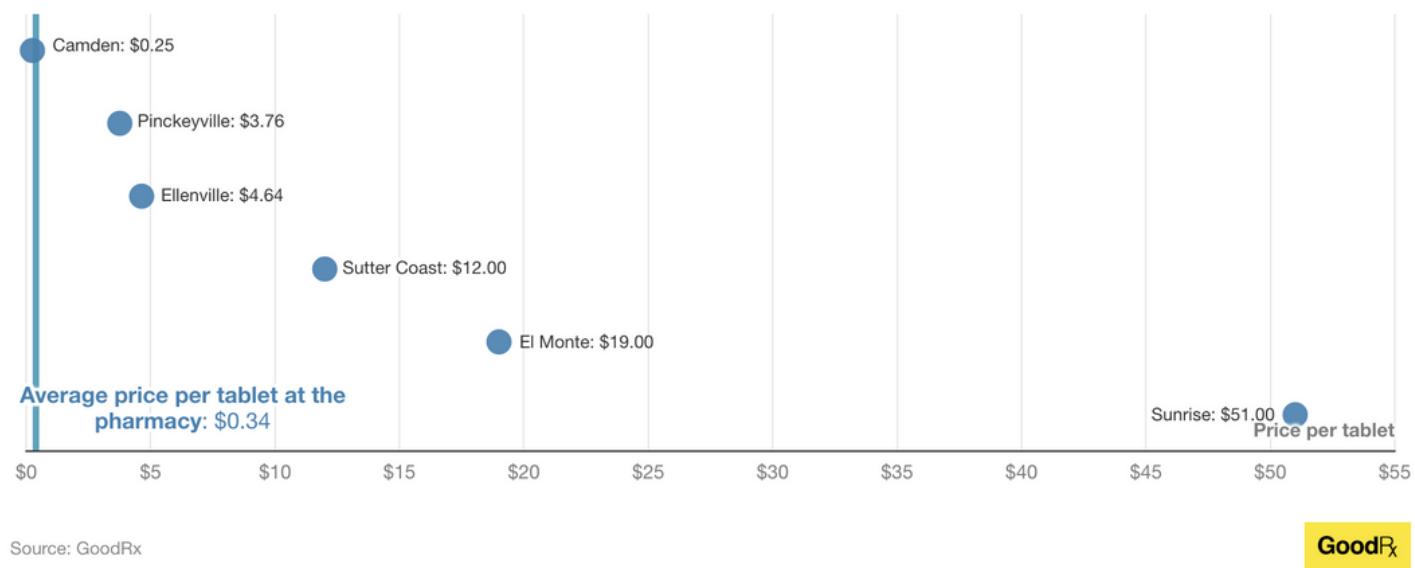
Source: GoodRx

GoodRx

## Appendix A9: Cash price for metformin 500 mg tablet

### Cash Price Per 500 mg Metformin Tablet

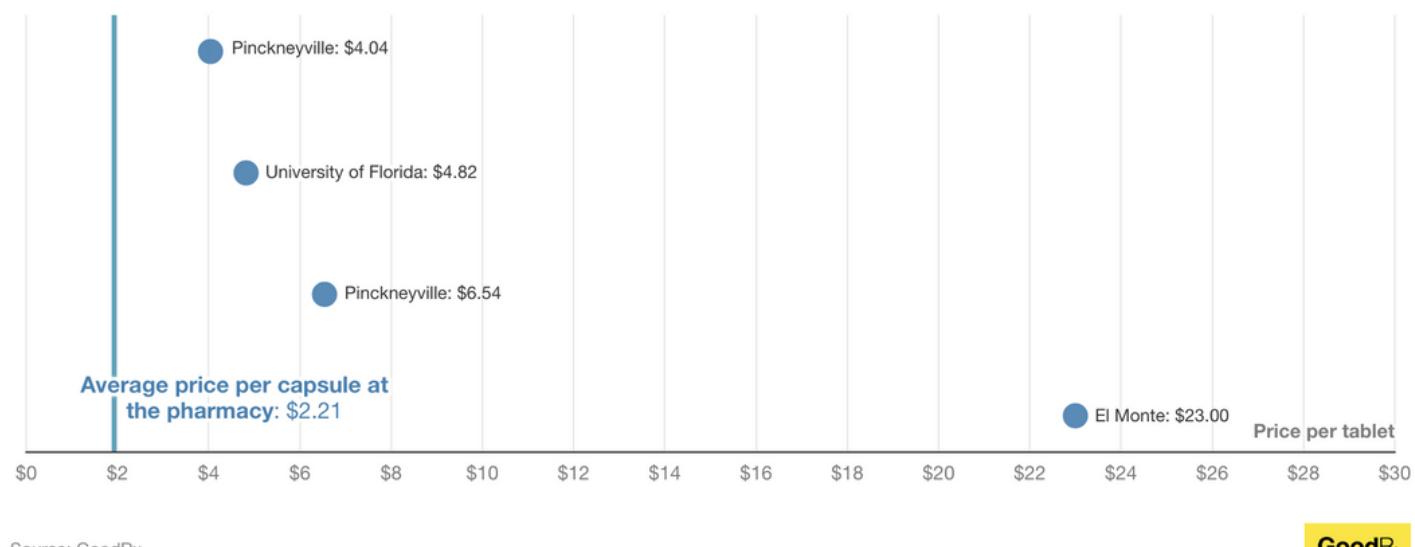
The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



## Appendix A10: Cash price for omeprazole 20 mg capsule

### Cash Price Per 20 mg Omeprazole Capsule

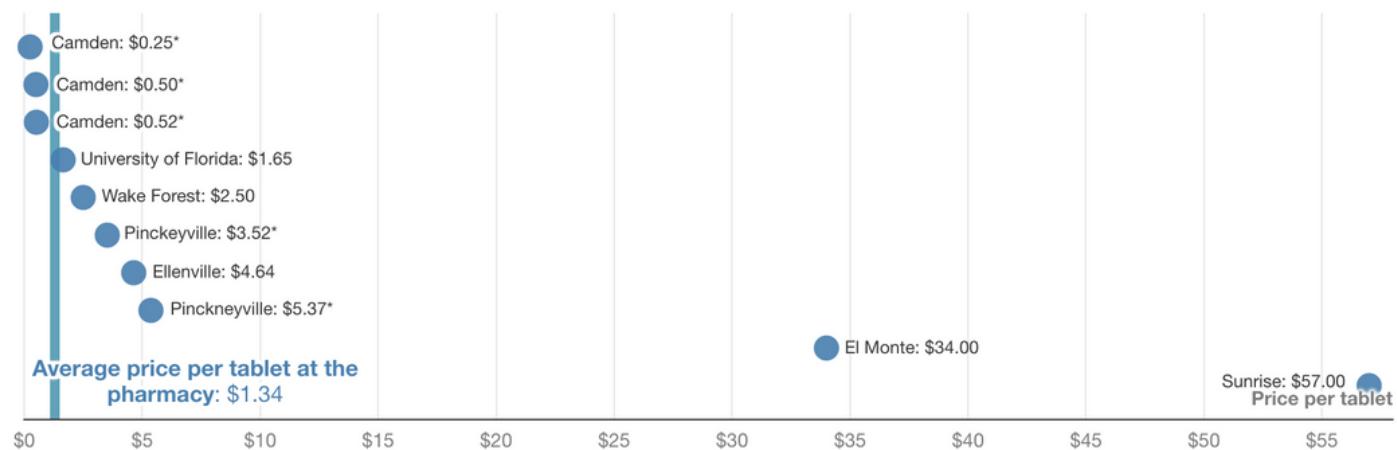
The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



## Appendix A11: Cash price for sertraline 50 mg tablet

### Cash Price Per 50 mg Sertraline Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



\*Note: Camden and Pinckneyville list multiple prices for sertraline 50 mg tablet

Source: GoodRx



## Appendix A12: Cash price for Xarelto 10 mg tablet

### Cash Price Per 10 mg Xarelto Tablet

The cash price per pill at hospitals compared to the average price per pill at pharmacies nationwide



Source: GoodRx



# APPENDIX B

## Appendix B1: CMS regulation checklist

### CMS Regulation Checklist

	Gross charge	De-identified maximum payer negotiated charge	De-identified minimum payer negotiated charge	Discounted cash price	Payer-specific negotiated charge	Drug charges
University of Florida Health	Unclear, but provides "Std Price"	Yes	Yes	Unclear, but provides "Uninsured"	Yes	Yes
Wake Forest Baptist Health	Yes	Yes	Yes	Yes	Yes	Yes
Asante Rogue Regional Medical Center	Yes	Yes	Yes	Yes	Yes	Yes
Baylor Scott & White Medical Center – Uptown	Yes	Yes	Yes	Yes	Yes	Yes
Albany Medical Center Hospital	Yes	Yes	Yes	Unclear, but provides "Cash Price"	Yes	Yes
University of Iowa Hospital	No	No	No	Unclear, but provides 'Uninsured Cash Rate'	No	Yes
Sutter Coast Hospital	Yes	Yes	Yes	Yes	Yes	Yes
New York Presbyterian Hospital	Yes	Provided for limited items and services	Provided for limited items and services	Yes	Yes	No
Las Palmas Medical Center	Yes	Provided for limited items and services	Provided for limited items and services	Unclear, but provides "Undiscounted Cash Price"	Yes	Yes
Sunrise Hospital and Medical Center	Yes	Provided for limited items and services	Provided for limited items and services	Unclear, but provides "Undiscounted Cash Price"	Yes	Yes
Beaumont Hospital, Farmington Hills	Unclear, but provides "Price"	Yes	Yes	Unclear, but provides "Uninsured"	Yes	Yes
Camden Clark Memorial Hospital	Yes	Yes	Yes	Unclear, but provides "Uninsured Cash Price"	Yes	Yes
Berkshire Medical Center	Unclear, but provides "Std Charge"	Yes	Yes	Unclear, but provides "Self Pay"	Yes	Yes
Ellenville Regional Hospital	Yes	Yes	Yes	Yes	Yes	Yes
Pinckneyville Community Hospital	Yes	Yes	Yes	Yes	Yes	Yes
Greater El Monte Community Hospital	Unclear, but provides "Item Price"	No	No	Unclear, but provides "Item Price"	No	Yes

## Appendix B2: Hospital data practice checklist

### Hospital Data Practice Checklist

	Provides a data dictionary	One table per file	All columns labeled	Does not contain duplicate rows	Contains only numerical values for price data fields	Contains unit and quantity of measurement	Contains NDCs
University of Florida Health	No	Yes	Yes	Yes	No, contains values such as "Bundled" and "Markup"	No	No
Wake Forest Baptist Health	No	Yes	Yes	No	Yes	No	No
Asante Rogue Regional Medical Center	No	Yes	Yes	Yes	Yes	Yes	Yes
Baylor Scott & White Medical Center – Uptown	No	N/A	Yes	No	Yes	No	No
Albany Medical Center Hospital	No	No	No	No	No, contains values such as "Open Charge"	Partially provided	No
University of Iowa Hospital	No	Yes	Yes	Yes	No, contains values such as "Manually priced"	No	Yes
Sutter Coast Hospital	No	Yes	Yes	Yes	Yes	No	Yes
New York Presbyterian Hospital	No	Yes	Yes	Yes	No, contains values such as "TBD"	No	No
Las Palmas Medical Center	No	No	Yes	Yes	No, contains values such as "% of BC" and "% of MCR"	No	No
Sunrise Hospital and Medical Center	No	No	Yes	Yes	No, contains values such as "% of BC" and "% of MCR"	No	No
Beaumont Hospital, Farmington Hills	No	Yes	Yes	No	Yes	No	Yes
Camden Clark Memorial Hospital	No	No	Yes	Yes	Yes	No	Yes
Berkshire Medical Center	No	No	Yes	No	No, contains values such as "Grouper"	No	No
Ellenville Regional Hospital	No	Yes	Yes	Yes	Yes	No	Yes
Pinckneyville Community Hospital	No	No	Yes	Yes	Yes	No	No
Greater El Monte Community Hospital	No	Yes	Yes	Yes	Yes	No	No