Software Price Modeling of Ertugliflozin

More Information

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What's A Fair Price To Pay For A Medicine?

It's an important question if you're an insurer, employer, or system and you're going to buy a lot of it.

A fair price for a medicine depends on two things:

- The medicine's performance for your patients
- The performance and price of every alternative drug

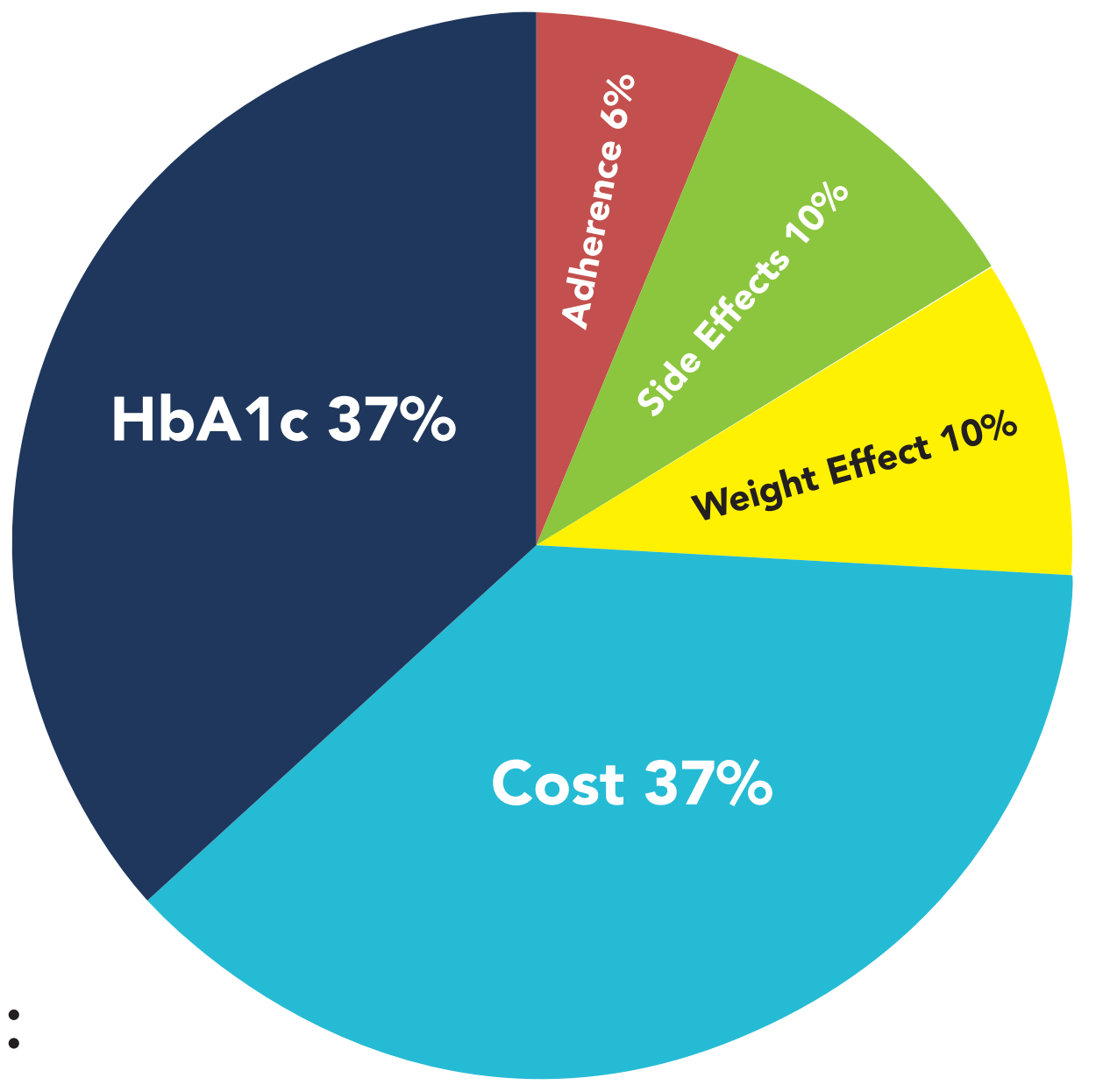
This poster shows you how to figure out a fair price for your patients for any medication, using ertugliflozin as an example.

Ask What's Important To Your Patients

When talking about medicines with patients, a few subjects seem to come up again and again:

Cost - Either patient-out-of-pocket cost, system cost, or both
Efficacy - How well this drug controls your patient' HbA1c
Weight effects - Whether patients tend to gain or lose body weight
Side effects - Both good (CV benefit) and bad (hypoglycemia risk)
Adherence - How hard it is to take this medicine on its schedule

How would your patients rank these in order of importance?

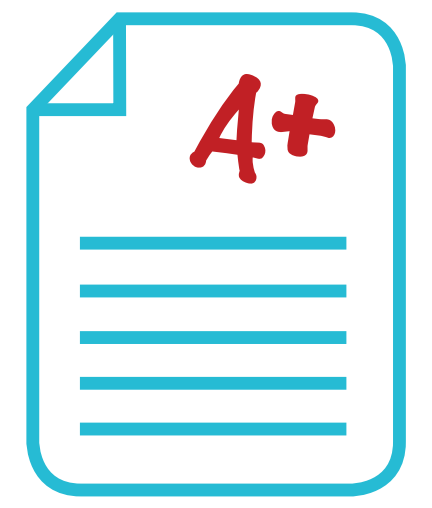


It helps to draw a pie chart where the size of each subject's slice represents how important it is for your patients. Here's ours:

The pie chart means you can talk objectively about decisions that involve trade-offs. For example, the pie chart allows you to say things like:

"Cost is almost four times more important to my patients than side effects."

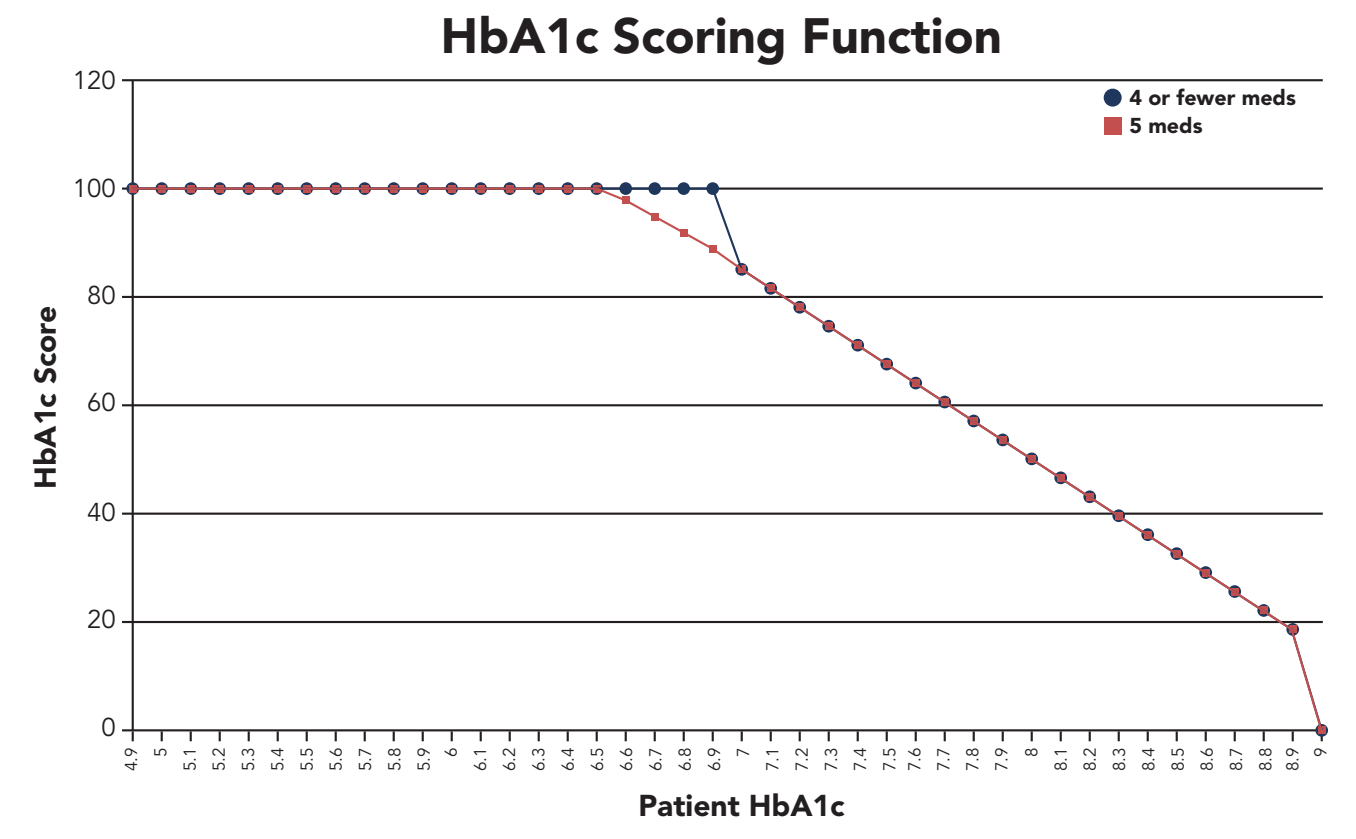
Show Success In Simple Scales



Your high school math, history, and science classes all used the same 0-to-100 scale for tests, even though they were different subjects. It was easy to see where you were doing well and what needed improvement.

Using a simple 0-to-100 scale to rate cost, efficacy, adherence, weight, and side effect outcomes allows you to know which areas are doing well and which are not.

Here's our 0-to-100 scale for HbA1c:



Know Your Population Metrics

Use your population's current optimized metrics as a baseline.
Here's ours for 191 anonymized patients:

6.9	$471	72
Avg HbA1c	Patient Cost/Month	Composite Score

Know Your Ertugliflozin

Here's the data we used to model ertugliflozin's performance:

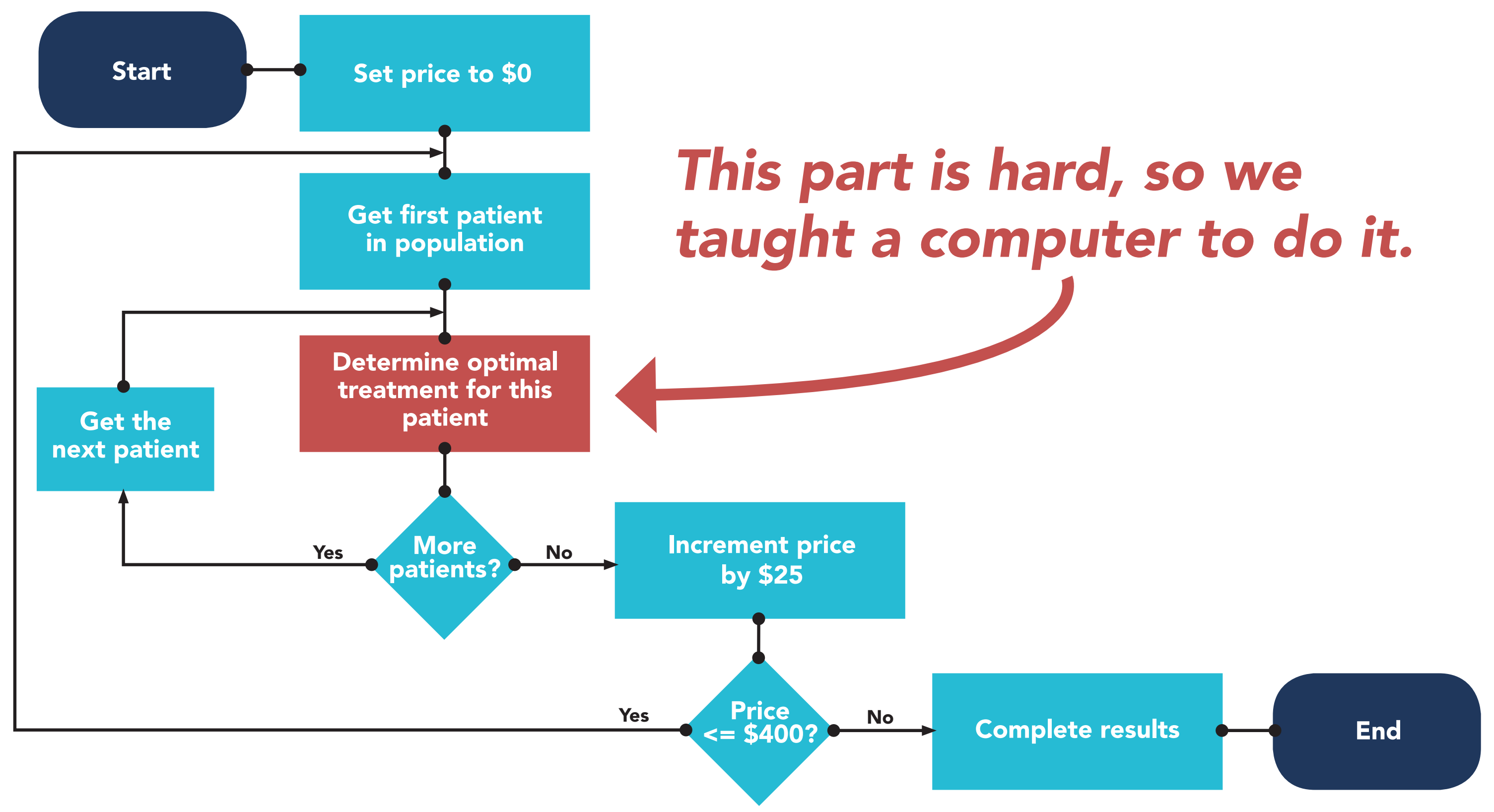
HbA1c reduction (monotherapy): 1.2%
Contraindications: Renal failure
Side Effect Scoring: + 1 if hypertension present
- 1 if elderly
- 1 to -2 yeast infection risk
BMI effect: slight loss (-1 on -10 to 10 scale w/0=neutral)
Adherence: Once daily oral

Start At $0 And Work Up

Determine how often ertugliflozin would appear in your patients' regimens if it was ***free***. Measure the change to your population's average Hba1c, monthly cost, weight, and side effect profiles.

Next, add $25 to ertugliflozin's price and repeat those measurements. Keep adding $25 and measuring your entire population until you reach a price of $400. (Ertugliflozin's retail price is around $325.)

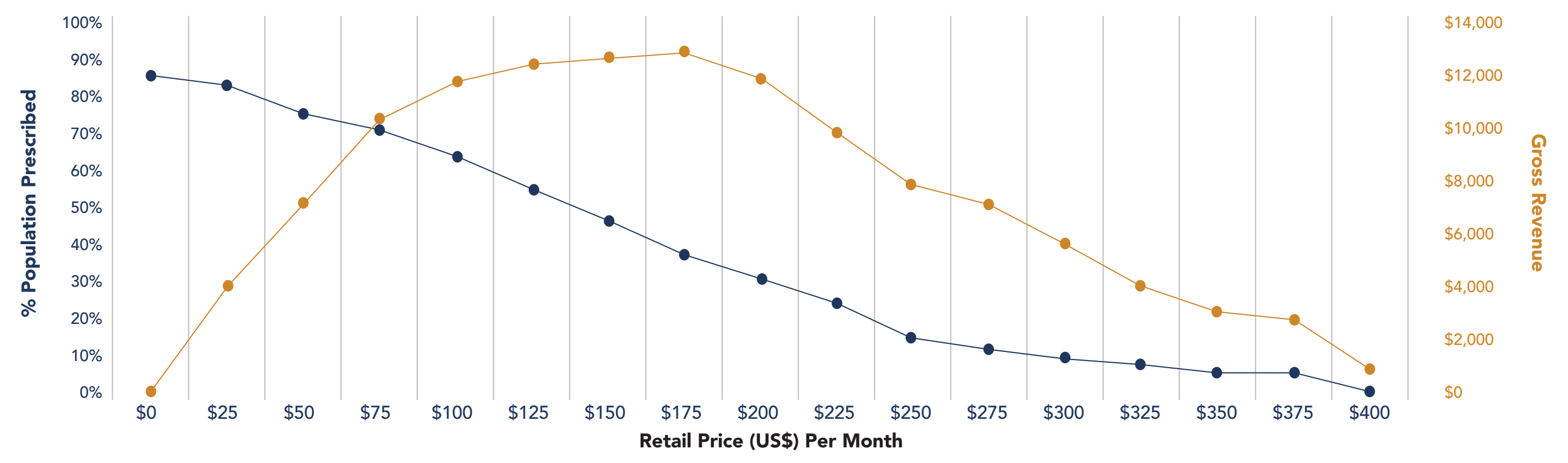
Here's a flowchart:



This part is hard, so we taught a computer to do it.

Put It All Together

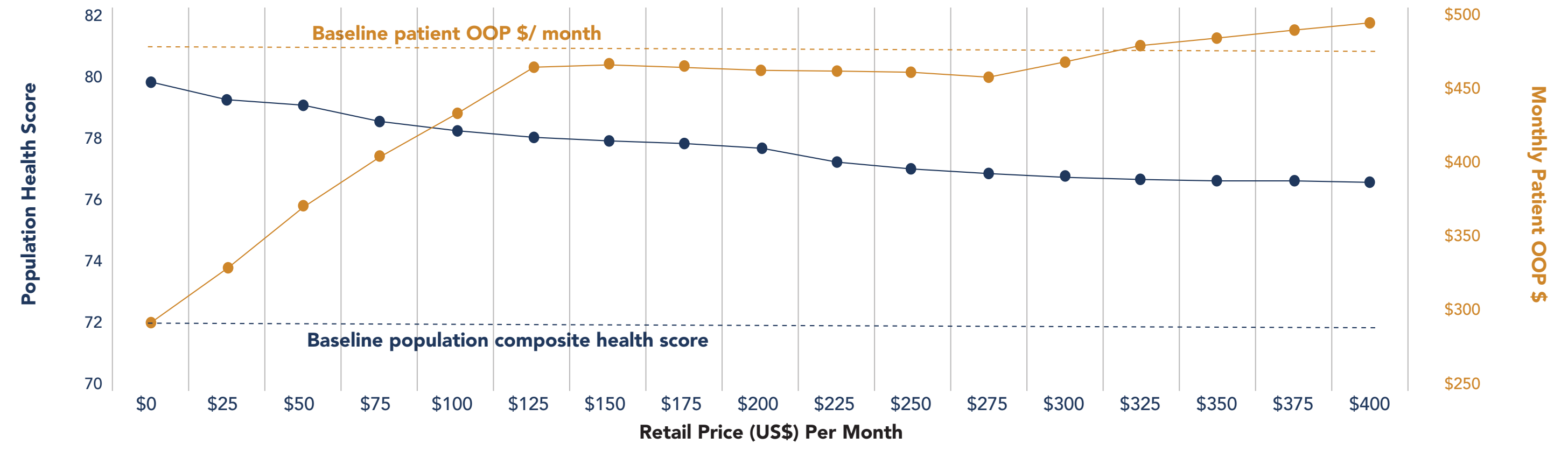
STEP 1: Plot the percent of your population who'd use ertugliflozin at each price point and the seller's gross revenue at that price.



- At $0 we'd prescribe ertugliflozin to ~85% of our population
- We can expect the seller to set a price that maximizes their revenue
- The seller's *gross* revenue is maximized between $150 - $175/month
- Gross revenue doesn't account for manufacturing, R&D costs, etc.
- But that tells us the price probably won't be less than $150

$0 — $150 — **Fair Price Somewhere In Here** — **$400**

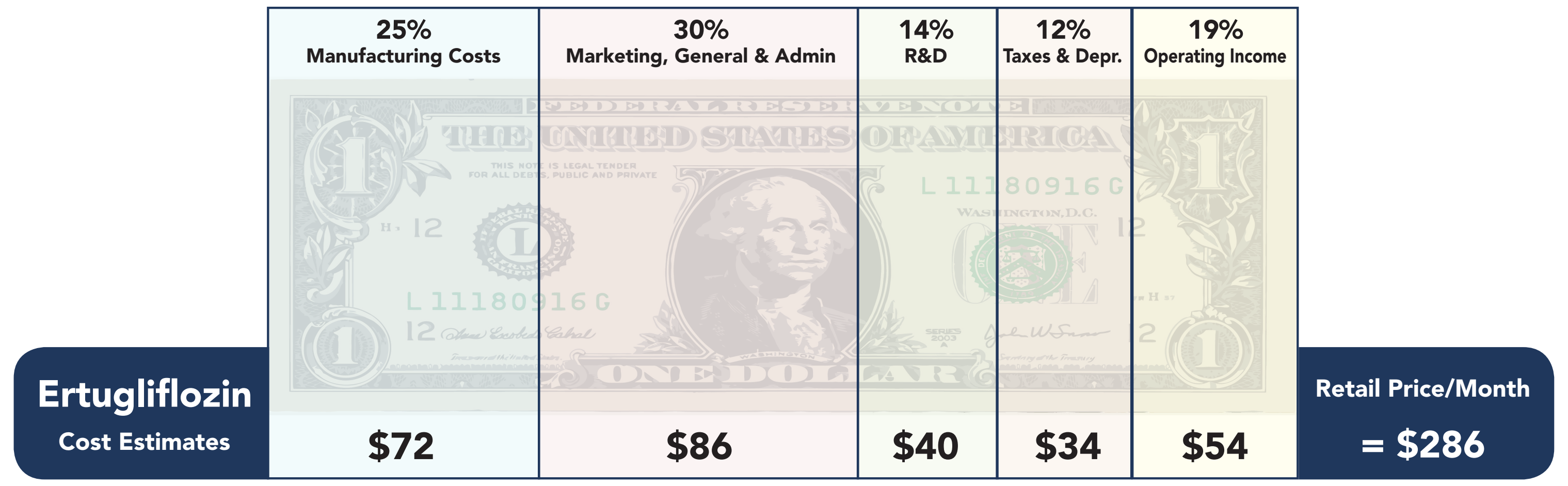
STEP 2: Find the most important Price-to-Performance points.
Our population's *composite health score* is better than our control group for any ertugliflozin price between $0 and $400



- Our population's *composite health score* is better than our baseline of 72 for any price up to $400
- We'd spend less on our *monthly cost per patient* for ertugliflozin prices up to $325
- Above $275, our monthly cost goes up while composite health score goes down
- That means we can use $275/month as the maximum monthly price for ertugliflozin

$0 — $150 — **Fair Price Somewhere In Here** — $275 — **$400**

STEP 3: Consider how much of your medication's price goes to advertizing and things that don't add value to your patients. These aren't secrets. Most companies publish these numbers for their investors.



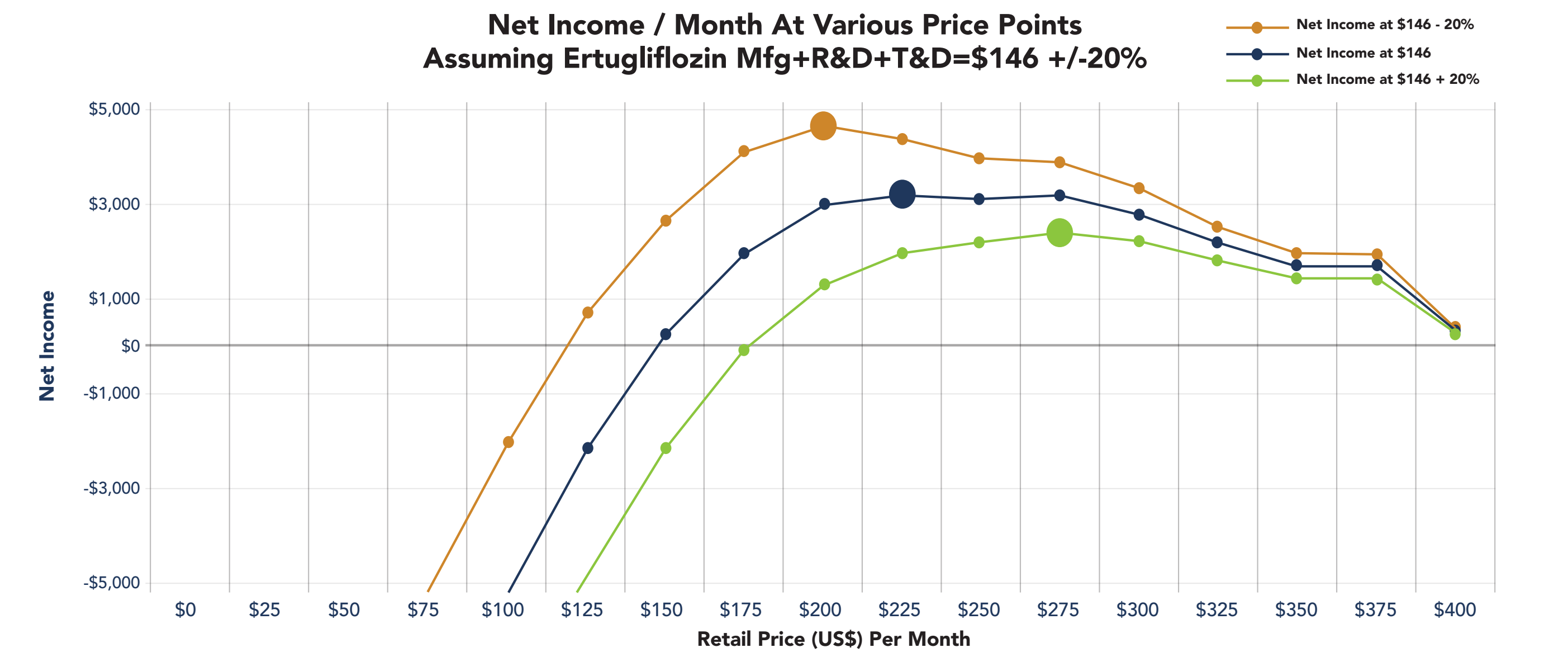
	25% Manufacturing Costs	30% Marketing, General & Admin	14% R&D	12% Taxes & Depr.	19% Operating Income	Retail Price/Month
Ertugliflozin Cost Estimates	$72	$86	$40	$34	$54	= $286

Source: Basu, Prabir & Joglekar, Girish & Rai, Saket & Suresh, Pradeep & Vernon, John. (2008) Analysis of Manufacturing Costs in Pharmaceutical Companies. Journal of Pharmaceutical Innovation. 3. 30-40. 10. 1007/s12247-008-9024-4. Table 4, p. 39. It's safe to assume there's a range of values for different manufacturers and medications. This is a poster, not a dissertation. We're happy to talk about it.

- Manufacturing ($72), R&D ($40), Taxes & Depreciation ($34) are hard to negotiate
- These represent approximately $146 for ertugliflozin

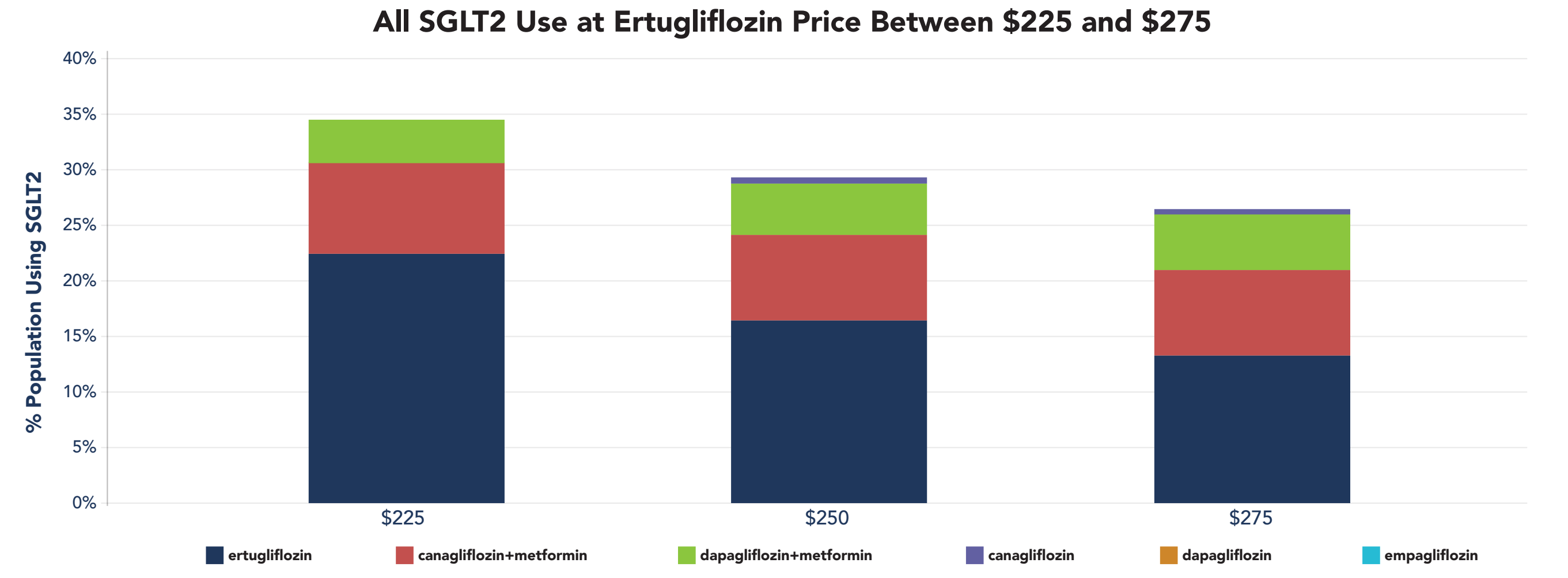
$0 — $150 — **Fair Price Somewhere In Here** — $275 — **$400**

STEP 4: Think like a seller.
If the cost to develop and manufacture ertugliflozin (plus taxes) is $146 +/- 20%, the seller maximizes their net revenue at a price between $225 and $275 no matter what the other costs are.



$0 — $225 — **Fair Price Range** — $275 — **$400**

STEP 5: Determine what you can give up in negotiations.
Among SGLT2s, a price of $225 to $275 suggests ertugliflozin would completely replace dapagliflozin and empagliflozin, and almost replace canagliflozin as monotherapy choices.



- Cost/month: Dapgliflozin=$490, empagliflozin=$503, canagliflozin=$497
- Some SGLT2+metformin combos are still recommended at their price points

$0 — $225 — **Fair Price Range** — $275 — **$400**

Getting The Best Price

- A fair price for ertugliflozin is $225 to $275 per patient per month.
- All key population metrics improve at this price range.
- This price range considers that the seller will act to maximize their net revenue.

$0 — $225 — **Fair Price Range** — $275 — **$400**

- Ertugliflozin replaces current SGLT2s dapagliflozin, empagliflozin, and canagliflozin at these prices.
- One negotiating strategy is to give up price discounts on existing SGLT2s in exchange for a discount on ertugliflozin. Giving up the discount has no impact to us because we are not going to buy the existing SGLT2s at their discounted prices anyways.
- Alternatively, the seller could steeply discount the price of existing SGLT2 or SGLT2 combo medicines in order to have those recommended more for our population.