

THE  
GENDER

INDUSTRIAL  
COMPLEX



AMERICAN  
PRINCIPLES  
PROJECT



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# DO NO HARM

Tears streamed down Chloe Cole's face as she spoke about her detransition journey in October 2022 during the "First Do No Harm Unity Rally" in Anaheim, California.<sup>1</sup> It was held in protest outside the American Academy of Pediatrics annual meeting. Cole was just 13 when the physicians attending that conference "fast-tracked" her down the "destructive path" of "gender-affirming care," a form of medical arson that involves puberty blockers, cross-sex hormones, and surgeries to ostensibly correct the "error" of having been born in the wrong body.

Cole painted a portrait of a young girl suffering under the shadow of mental health issues. She was plagued by anxiety, depression, pubertal struggles, and body dysmorphia. It all was exacerbated by a kaleidoscope of caricatures of what it means to be a woman today. "I saw how girls and women are portrayed in media from cartoons to Instagram posts to porn," she said. "I tore myself apart because on all fronts, there was some ideal that I failed to achieve."

"The girls and women I knew growing up always talked about how horrible being a woman is, how terrible periods are, how unbelievably painful pregnancy and childbirth are, and never the blessings that come with any of it," Cole continued. "This association with femininity was inevitable." She said it also made her double mastectomy—the surgical removal of both breasts—at 15 years old inevitable. But Cole has since wiped away her tears. Last year, she announced a lawsuit against the Kaiser Permanente healthcare system.<sup>2</sup>

<sup>1</sup> Partners for Ethical Care, "First Do No Harm Unity Rally- Detransitioner Chloe Cole Speaks Out," YouTube, October 6, 2022, <https://www.youtube.com/watch?v=JOGq5Bq4cVw>.

<sup>2</sup> Chloe Cole v. Kaiser Permanente, <https://s3.documentcloud.org/documents/23693707/chloe-complaint-clean.pdf>.

The filing states Cole was “coerced” to undergo “gender-affirming care” based on falsehoods. Cole, who had struggled with perceived “gender dysphoria” starting at age 9, was convinced by doctors that her mental health issues would not resolve unless she were to socially and medically transition. They also told Cole and her parents that forgoing that would put her at a high risk of suicide. Neither Cole nor her parents were made aware of the high desistence rate for children diagnosed with gender dysphoria. Instead, they were locked in the path, the door slammed shut behind them.

Cole’s parents told her they were given the following ultimatum: “would you rather have a dead daughter or a live son”? So began the transformation that left a young girl’s mind and body broken.

## DETRANSITIONERS

Cole isn’t the only one suing. More victims are coming forward to tell their stories, even as physicians in the United States plow forward with promoting “gender-affirming care” as an unalloyed good.

In June, Kayla Lovdahl filed a lawsuit against Kaiser. Two of the doctors who treated Cole are implicated.<sup>3</sup>

Like Cole, Lovdahl said she experienced mental health issues from a young age. At 11, she was exposed to transgender influencers online. Lovdahl was on puberty blockers within a year. All it took to get this life-altering ball moving was a consultation with Susanne E. Watson, a psychologist and the clinical director of the Multi-Specialty Transitions Department at Kaiser Permanente Oakland Medical Center. Watson determined Lovdahl was transgender after a 75-minute evaluation. According to the filing, Lovdahl’s physicians “promptly placed her on puberty blockers and testosterone at age 12.” She received a double mastectomy within six months, when she was 13.

**Cole’s parents told her they were given the following ultimatum: “would you rather have a dead daughter or a live son”?**



Chloe Cole. Image courtesy of Chloe Cole/ Youtube.

<sup>3</sup> Kayla Lovdahl v. Kaiser Foundation Hospitals, Inc., <https://libertycenter.org/wp-content/uploads/2023/06/1.-Complaint-1.pdf>.

Lovedahl's physicians "promptly placed her on puberty blockers and testosterone at age 12." She received a double mastectomy within six months, when she was 13.



Kayla Lovdahl

Lovedahl eventually detransitioned and received the therapy she needed all along, but the ordeal left her with emotional and physical scars that will take a long time to heal.

In North Carolina, Prisha Mosley filed a lawsuit in July against several parties she said railroaded her into transitioning. Mosley was sexually assaulted when she was 14. It resulted in a miscarriage and deep emotional wounds. At Moses Cone Memorial Hospital, she would see physicians for psychiatric issues including depression, anorexia, and obsessive-compulsive disorder.<sup>4</sup>

In January 2015, Mosley was seen at Cone Health's Tim and Carolyn Rice Center for Child and Adolescent Health for an 80-minute evaluation related to her eating disorder. She had just been discharged from the emergency department. During that meeting, a resident concluded that a "gender identity crisis" was "most likely the underlying issue that drives her eating disorder and emotional distress." That started the process of doctors guiding Mosley along the transition roadmap. According to the lawsuit, Mosley received a "depo shot" while she was being seen for mental health issues. The injection was intended to stop her from having periods as the first step in transitioning. It was done without Mosley's parents being made aware. She was a minor.

In Texas, Soren Aldaco filed a lawsuit over the summer against the Crane Clinic for Transgender Surgery.<sup>5</sup> Like the others, Aldaco was plagued by psychological stressors, including the loss of a grandmother and discomfort with her body when she went through puberty early. She, too, turned to the internet, where she came under the influence of transgender content. She even entertained and experimented with the idea of living as a boy. It didn't help.

Her psychological issues worsened, crippling her ability to function normally. Aldaco's parents admitted her to Mesa Springs Psychiatric Hospital in Fort Worth after a manic episode. There, at the age of 15, she was "relentless-

<sup>4</sup> Prisha Mosley v. Eric T. Emerson, [https://first-heritage-foundation.s3.amazonaws.com/live\\_files/2023/07/Prisha-Mosley-File-Stamped-Complaint-7.17.23.pdf](https://first-heritage-foundation.s3.amazonaws.com/live_files/2023/07/Prisha-Mosley-File-Stamped-Complaint-7.17.23.pdf).

<sup>5</sup> Soren Aldaco v. Del Scott Perry, [https://www.scribd.com/document/660451210/Aldaco-Gender-Modification-Suit#fullscreen&from\\_embed](https://www.scribd.com/document/660451210/Aldaco-Gender-Modification-Suit#fullscreen&from_embed).

ly pressed” about her gender identity by a doctor named Sreenath Nekkallapu. Without conducting any “meaningful or comprehensive psychobehavioral examination,” Nekkallapu jumped to “the conclusion that the sole explanation for Soren’s psychotic break was her needing to embrace a transgender identity, after only knowing her for mere minutes,” the lawsuit states. The following year, Aldaco began attending a “transgender support group” in Fort Worth called Trans-Credence International, where children and adolescents would be paired with “elders” who would guide them in their “gender journey.” Through that group Aldaco connected with Del Scott Perry, the doctor who put her on gender drugs. Although Perry does not identify as transgender, he regularly attended the meetings and built a clientele list through them.

After their first half-hour appointment at his office, Perry gave her a prescription for “her first round of cross-sex hormones, anastrozole (an estrogen blocker) and testosterone cypionate (together with the anastrozole, the ‘cross-sex hormones’), at an outrageously large, off-label dosage,” the filing states. Aldaco was 17. According to the lawsuit, Perry “never sought or obtained any written parental consent” from her parents. She also went under the knife at Crane Clinic for a flawed and excruciating double mastectomy. Her doctors downplayed the complications and were indifferent toward her cries for help. When she was finally seen for emergency treatment at a hospital in Dallas, surgeons diagnosed Aldaco with “massive bilateral hematomas.” They had to re-open the incisions made at Crane Clinic to drain blood and other bodily fluids. Aldaco’s physicians promised a troubled young girl happiness; they gave her a living hell and a butchered body.

The most recent case is Luka Hein, a 21-year-old Minnesotan who began transitioning when she underwent a double mastectomy at 16. Three years prior to that, in 2015, Hein’s parents divorced. It was devastating for her. The filing states that within a year, Hein was suffering from anxiety and panic attacks that “immobilized” her.<sup>6</sup> “She



Soren Aldaco. Courtesy Austin City Council Meeting/YouTube.

**Aldaco’s physicians promised a troubled young girl happiness; they gave her a living hell and a butchered body.**

<sup>6</sup> Luka Hein v. University of Nebraska Medical Center, [https://www.scribd.com/document/660451210/Aldaco-Gender-Modification-Suit#fullscreen&from\\_embed](https://www.scribd.com/document/660451210/Aldaco-Gender-Modification-Suit#fullscreen&from_embed).

**After a 55-minute consultation, Hein was diagnosed with “gender identity disorder.” The fact that she was on a cocktail of medications and plagued by a variety of psychiatric issues only seemed to validate that diagnosis.**



Luka Hein

lost her appetite, became easily angered, started cutting, and expressed suicidal ideation,” the lawsuit says. “She began counseling with a therapist and a psychiatrist who diagnosed depression and generalized anxiety disorder. Her psychiatrist put her on antipsychotic medication, but she continued to spiral downward.” Hein eventually broke down and ended up in a “partial psychiatric program” where she was diagnosed with depression.

Worse still, Hein fell victim to a sexual predator online around this time, which sent her spiraling further, resulting in increased antipsychotic medication as part of her daily regimen.<sup>7</sup> It was also around this time that Hein became aware of “transgender influencers who extolled the virtues of hormones and surgery.” That, coupled with the trauma she had experienced, put her on the path to transitioning. She found her way to a therapist who affirmed her gender confusion in 2017. After a 55-minute consultation, Hein was diagnosed with “gender identity disorder.” The fact that she was on a cocktail of medications and plagued by a variety of psychiatric issues only seemed to validate that diagnosis. The following year, on her very first visit to a gender clinic, Hein was fast-tracked for breast removal surgery at 15. When Hein’s parents expressed concerns about the procedure, they were told that Hein “would take her own life.”

Hein progressed to testosterone but stopped after four years “due to heart irregularities, aching joints, and pelvic pain.” Like Aldaco and all the rest, Hein was promised a cure-all. But by the time she decided to detransition, Hein could not function or get out of bed.

Most high-profile cases of people quitting transitioning involve females. But there is a growing number of males who are also piecing their lives together after being encouraged to go down this road. One of them agreed to be interviewed for this report.

<sup>7</sup> Matthew Impelli, “Woman Blames Social Media Influence for Her Transgender Surgery,” *Newsweek*, September 12, 2023, <https://www.newsweek.com/woman-blames-social-media-influence-transgender-surgery-1827179>.



## THE LIFE OF RICHARD

Richard Anumene doesn't like the term "detransitioner" because, he says, it legitimizes a falsehood. People can't transition into what they're not. He knows that now, after undergoing hormone therapy and surgeries.

"Desister" is the term Richard prefers because he desisted the delusion of transgenderism. But not until after undergoing his final procedure: a vaginoplasty.

"My entertaining that lifestyle choice was due to my adverse childhood experiences," he said. His childhood was filled with physical and sexual abuse from his parents and his brother. "My disgust with myself is a result of my sexual abuse that I endured as a child at the hand of my now deceased older brother, who committed suicide in 2018."

That abuse was the driving force behind the psychological distress that led Richard to seek gender therapy.

"That really was the cause of my disassociation of self, my dislike of myself, my dislike of my genitalia . . . my not wanting to grow up into a man," he said. "I didn't want to become like my brother. I didn't want to become like my dad."

Richard's mother and father immigrated from Nigeria to the United States, settling in California. The family moved around the state, but Richard was raised in what was essentially a Nigerian enclave, growing up under a faith system that combines traditional African beliefs and Christianity. Many Nigerian Christians believe in witchcraft. Richard's father accused his mother of it and separated from her. Home life was chaotic and broken.

The parents would fight and vent their anger on Richard and his four siblings when they were together. All the while, Richard said, his brother would sexually violate him. He'd also force him to watch pornography. The sexual abuse began before Richard was ten.

"I've been on psych medicine since I was seven years old," he said. "I've been in and out of hospitals across the state since I was seven." Yet Richard's father continued to ignore the source of the problem: abuse at home.

"We never even had therapy for all of the familial problems." Culturally, it was taboo for his father, as a traditional Nigerian patriarch, to acknowledge them.

**"My entertaining that lifestyle choice was due to my adverse childhood experiences."**

**–Richard Anumene**



Richard Anumene



Pretending it wasn't happening didn't make it go away. Sexual violence shattered Richard's self-conception. He began wearing women's clothing from a very young age. But it was never explicitly sexual. Richard described this period as one of incoherence, a desperate attempt to disassociate himself from the boy whose body was being violated.

One day, Richard was caught cross-dressing by his father, who took all the clothes and burned them in the yard. He was booted out of the house. It wouldn't be the last time. A period of itinerant homelessness followed. The lack of a familial support system exacerbated everything.

Around the time he turned 17, Richard began to conceive of himself as a woman in a more concrete way. A social worker put him in touch with Carlos Morales, a counselor associated with the World Professional Association for Transgender Health (WPATH). According to Richard, Morales encouraged him to seek gender therapy to affirm his new identity as "Alice." His transition began at the Gender Pathways Clinic at Kaiser Permanente San Francisco Medical Center.

Hormone therapy for Richard started at 19. All it took was a single, brief consultation. After that followed facial feminization and vaginoplasty surgeries. At no point, Richard said, did anyone counsel him against transitioning. His diagnosed psychiatric disorders stemming from years of abuse gave no one pause. Indeed, despite his documented history of mental illness, Richard said the whole process was treated like nothing more significant than getting a tattoo. Everything was paid for through Medi-Cal, California's Medicaid program.

There was little to no follow-up care. Richard said the vaginoplasty left him with recurring bleeding and pain. It also disabused him of the idea of transitioning. He had made a terrible mistake. But where were the medical guardrails that should have stopped him from getting to that point?

In the aftermath, no one wanted to admit or even consider the possibility that they had enabled him to do something not in his best interest. Morales was defensive when confronted. So was Richard's surgeon. "They tried to pin the blame on me," he said.

Since desisting, Richard has filed a lawsuit against Kaiser Permanente, Morales, and a social worker.

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# BIG

# BUSINESS

A surgeon interviewed for this report calls people like Richard “full-circle patients.” This person asked not to be named. He is certified by the American Board of Plastic Surgery and is a member of various medical societies.

Between 2015 and 2016, he worked extensively with trans-identified individuals at a facility on the East Coast. The patient coordinator was a member of WPATH. “The coordinator was always very pushy,” he recalled. “It was always about doing more surgeries.”

Though he continues to practice, he no longer sees people seeking transition procedures. I asked him why.

“The patients were getting younger,” he said.

“I remember I saw a 19-year-old once.” This particular patient wanted a double mastectomy. “I didn’t do it,” he said.

Since then, his opposition to transgender medicine has only grown. He blames medical societies for failing to uphold standards of care that would protect patients from irreversibly damaging their bodies.

“The prevention, delay, or whatever pharmacological and especially surgical disruption of the process we call puberty is a crime against humanity,” he told me. “It’s horrible what we do to kids.” His voice sank, and he became emotional and had to pause during our discussion to collect himself. He likened transition therapy to eugenics. It’s also a “new brand of medicine” that can be “exploited” by the medical industry, he said.

“The surgeries, the revisions, and all that stuff—it’s big business.”

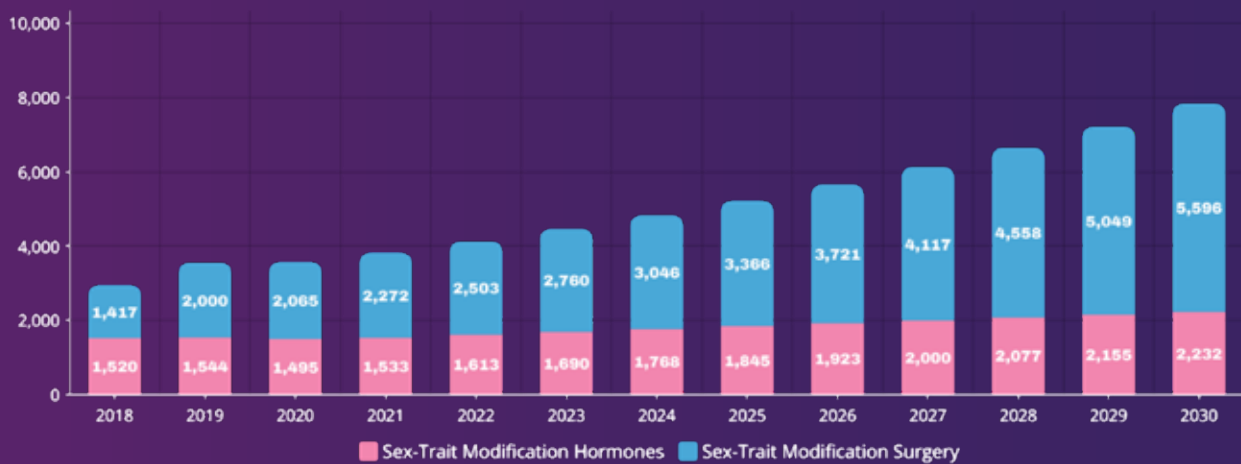
Many surgeons receive compensation based on their productivity, which is measured in “relative value units” (RVUs). The number is derived from the amount of work

and effort physicians expend for each patient, service, and procedure. RVUs are used to determine how much to pay doctors.

Approximately one-quarter of the 15 million operations Americans have each year are unnecessary. Saying no to an operation, even an unnecessary one, means less take-home pay, and as coverage for certain procedures increases, so do the incentives. Back surgeries are a good example. There are two options for treating a herniated disk: a discectomy and a lumbar spine fusion. The former takes 45 to 90 minutes, with patients usually out the door on the same day. The latter takes longer and often requires a hospital stay of two to three days. Unsurprisingly, “the number of lumbar fusions increased steadily among people covered by Medicare between 2004 and 2009,” according to STAT.<sup>8</sup> Medicare spending on lumbar spine fusions has increased 500 percent over that time, while the rates of the surgeries have also risen.

<sup>8</sup> Simone Betchen, “Surgery needs a new pay model, free from incentives to do more procedures,” STAT News, September 19, 2022, <https://www.statnews.com/2022/09/19/surgeons-payment-model-incentives/>.

## SEX-TRAIT MODIFICATION SURGERY AND HORMONE REVENUE, 2018-2030 (USD MILLION)



Source: Grand View Research. For more, see appendix.


# THE COSTS OF TRANSITIONING

It is difficult to put a precise price tag on the process of sex-trait modification, given the sheer variety of procedures offered; the wide range in costs; and the additional unknowns of required follow-up, potential complications, etc. However, based on the data provided by

Grand View Research, the following can be considered a very rough (and likely conservative) estimate of the total cost for both a male and a female to undergo the complete sex-trait modification process.

## MALE TRANSITIONER

 Puberty Blockers  
**\$3,000-25,000** per year

 Estrogen  
**\$240-2,400** per year

 Anti-Androgens  
**\$120-240** per year

 Facial Feminization Surgery  
**\$20,000-50,000**


 Electrolysis or Laser Hair Removal  
**\$50-1,000** per session

 Augmentation Mammoplasty  
**\$6,000-12,000**

 Vocal Training  
**\$50-200** per session

 Voice Feminization Surgery  
**\$5,000-9,000**

 Vaginoplasty  
**\$10,000-\$40,000**

 Reduction Thychondroplasty  
**\$3,500-7,000**

 Orchiectomy  
**\$5,000-8,000**

Total cost of fully transitioning:

**\$87,300-410,600\***

# FEMALE TRANSITIONER

 Puberty Blockers  
**\$3,000-25,000** per year

 Testosterone  
**\$200-4,200** per year

 Mastectomy  
**\$15,000-50,000**

 Chest Masculinization Surgery  
**\$6,000-10,000**

 Hysterectomy  
**\$9,500-\$22,500**

 Scrotoplasty  
**\$4,000-6,000**

 Phalloplasty  
**\$20,000-150,000**

 Metoidioplasty  
**\$20,000-30,000**

Total cost of fully transitioning:

**\$66,500-605,500\*\***

\* This assumes 5 years of puberty blockers (although there is no standard length of treatment, which can vary widely by individual), 60 years of hormone use (from age 16 to 76 — the average age of life expectancy), \$1,000 total for hair removal treatment, and \$200 total for vocal training.

\*\* This assumes 5 years of puberty blockers (although there is no standard length of treatment, which can vary widely by individual) and 60 years of hormone use (from age 16 to 76 — the average age of life expectancy).



# LITTLE DATA

There are common threads that run through all these accounts. Mental health issues are often present, ranging from mood, anxiety, post-traumatic stress, and personality disorders. In 2021, the *Australian Journal of Psychology* published an analysis of data from gender clinics in the United States and the Netherlands that showed mood and anxiety disorders were the most common psychiatric conditions observed in patients diagnosed with gender dysphoria.<sup>9</sup> Another study<sup>10</sup> published in *Nature Communications*, a highly regarded peer-reviewed journal, concluded that autistic people are three to six times more likely<sup>11</sup> than neurotypical people to feel confused about their gender. It is worth noting Cole has said she is autistic and that being on the spectrum while undiagnosed was one of the things she struggled with as a young girl.

A gender dysphoria diagnosis often acts as the basis for starting or accelerating gender care, which is accompanied by the specter of suicidality: people, parents in particular, are told that unless they go through with transitioning, the risk of self-harm increases by over 40 percent, to cite a common statistic. But that oft-mentioned figure comes from

<sup>9</sup> Tabitha Frew, Clare Watsford, and Iain Walker, "Gender Dysphoria and Psychiatric Comorbidities in Childhood: A Systematic Review," *Australian Journal of Psychology*, Informa UK Limited, May 5, 2021, <https://doi.org/10.1080/00049530.2021.1900747>.

<sup>10</sup> Varun Warriar, David M. Greenberg, Elizabeth Weir, Clara Buckingham, Paula Smith, Meng-Chuan Lai, Carrie Allison, and Simon Baron-Cohen, "Elevated Rates of Autism, Other Neurodevelopmental and Psychiatric Diagnoses, and Autistic Traits in Transgender and Gender-Diverse Individuals," *Nature Communications*, Springer Science and Business Media LLC, August 7, 2020, <https://doi.org/10.1038/s41467-020-17794-1>.

<sup>11</sup> Laura Dattaro, "Largest study to date confirms overlap between autism and gender diversity," *Spectrum News*, September 14, 2020, <https://www.spectrumnews.org/news/largest-study-to-date-confirms-overlap-between-autism-and-gender-diversity/>.



the U.S. Transgender Survey, an anonymous online survey conducted in 2015 by the National Center for Transgender Equality, a nonprofit advocacy group.<sup>12</sup> Likewise, in a similar anonymous survey, The Trevor Project, an LGBTQ advocacy group, reported that 52 percent of respondents said they had considered suicide.<sup>13</sup> However, as Reuters noted, citing a number of experts, “online surveys have become common in science, but researchers say they may not be fully representative of the larger population being studied.”<sup>14</sup> Even the 2015 survey states that it is “not appropriate to generalize the findings in this study to all transgender people.” It is also worth noting that organizations like The Trevor Project receive significant financial contributions from corporations that sell the drugs used in “gender-affirming care.”

More recent research tells a different story about the relationship between “gender-affirming care” and self-harm. A landmark Finnish study published in February showed that providing adolescents and young adults with drugs and surgeries related to transgenderism did not appear to have any

<sup>12</sup> Williams Institute, “More than 40% of transgender adults in the US have attempted suicide,” UCLA School of Law, July 20, 2023, <https://williamsinstitute.law.ucla.edu/press/transpop-suicide-press-release/>.

<sup>13</sup> Sam Levin, “More than 50% of trans and non-binary youth in US considered suicide this year, survey says,” The Guardian, December 17, 2022, <https://www.theguardian.com/us-news/2022/dec/16/us-trans-non-binary-youth-suicide-mental-health>.

<sup>14</sup> Chad Terhune, Robin Respaut, and Michelle Conlin, “As more transgender children seek medical care, families confront many unknowns,” Reuters, October 6, 2022, <https://www.reuters.com/investigates/special-report/usa-transyouth-care/>.

## POTENTIAL COMPLICATIONS FROM SEX-TRAIT MODIFICATION

Source: Grand View Research. For more, see appendix.

Breast Cancer	Nerve Damage
Prostate Cancer	Chronic Pain
Endometrial and Ovarian Cancer	Sexual Dysfunction
Liver Cancer	Mental Health Issues
Surgical Complications	Need for Additional Surgeries

meaningful effect on suicide rates.<sup>15</sup> “Clinical gender dysphoria does not appear to be predictive of all-cause nor suicide mortality when psychiatric treatment history is accounted for,” the authors found. In other words, individuals with a history of mental illness were more likely to kill themselves than those who simply identified as transgender. Similarly, a California study published in 2021 found that the attempted suicide rate among trans-identified men who underwent a vaginoplasty was twice as high during the post-surgery period compared to the pre-surgery period.<sup>16</sup> “Patients undergoing [gender-affirming surgery] with a history of prior psychiatric emergencies or feminizing transition are at higher risk and should be counseled appropriately,” the authors noted.

Nevertheless, medicalized transitioning has gained legitimacy with the help of medical groups like the American Academy of Pediatrics and the Endocrine Society. The aforementioned WPATH is another key organization. Its standards of care provide treatment guidelines for others

<sup>15</sup> Sami-Matti Ruuska et al., “All-Cause and Suicide Mortalities among Adolescents and Young Adults Who Contacted Specialised Gender Identity Services in Finland in 1996–2019: A Register Study,” *BMJ Mental Health*, January 1, 2024, <https://mentalhealth.bmj.com/content/27/1/e300940>.

<sup>16</sup> Kai Dallas et al., “MP04-20 Rates of psychiatric emergencies before and after gender affirming surgery,” *The Journal of Urology*, 206 (Supplement 3). <https://doi.org/10.1097/ju.0000000000001971.20>.



to follow around the world and are also used to justify insurance coverage and gender medical interventions. Yet even WPATH has been forced to concede that there is a dearth of studies behind the long-term effectiveness of these treatments for adolescents with gender dysphoria. Its latest guidelines, published in September of this year, state that “the number of studies is still low, and there are few outcome studies that follow youth into adulthood.”<sup>17</sup> WPATH also makes the remarkable admission that “a systematic review regarding outcomes of treatment in adolescents is not possible.” The organization was recently embroiled in controversy when leaked messages obtained by Environmental Progress revealed that WPATH members “demonstrate a lack of consideration for long-term patient outcomes despite being aware of the debilitating and potentially fatal side effects of cross-sex hormones and other treatments.”<sup>18</sup> Specifically, they “show that patients with severe mental health issues, such as schizophrenia and dissociative identity disorder, and other vulnerabilities such as homelessness, are being allowed to consent to hormonal and surgical interventions.”

Like WPATH, the Endocrine Society acknowledges that behind its recommendations for “gender-affirming hormone treatment” and surgery, “the quality of evidence is usually low.”<sup>19</sup> In 2009, the society’s influential journal recommended treating “transsexual adolescents” with puberty blockers that are mainly manufactured by Endo International and AbbVie Inc.<sup>20</sup> To date, these drugs are

**The WPATH Files**  
**“show that patients with severe mental health issues, such as schizophrenia and dissociative identity disorder, and other vulnerabilities such as homelessness, are being allowed to consent to hormonal and surgical interventions.”**

<sup>17</sup> E. Coleman et al., “Standards of Care for the Health of Transgender and Gender Diverse People, Version 8.” *International Journal of Transgender Health*, Informa UK Limited, August 19, 2022. <https://doi.org/10.1080/26895269.2022.2100644>.

<sup>18</sup> Mia Hughes, “The WPATH Files: Pseudoscientific Surgical and Hormonal Experiments on Children, Adolescents, and Vulnerable Adults,” *Environmental Progress*, March 4, 2024, <https://static1.squarespace.com/static/56a45d683b0be33df885def6/t/6602fa875978a01601858171/1711471262073/WPATH+Report+and+Files111.pdf>.

<sup>19</sup> Wylie C Hembree et al., “Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society Clinical Practice Guideline,” *The Journal of Clinical Endocrinology & Metabolism*, Volume 102, Issue 11, 1 November 2017, Pages 3869–3903, <https://doi.org/10.1210/jc.2017-01658>.

<sup>20</sup> Wylie C. Hembree, “Endocrine Treatment of Transsexual Persons: An Endocrine Society Clinical Practice Guideline,” *The Journal of Clinical Endocrinology & Metabolism*, September 1, 2009. <https://doi.org/10.1210/jc.2009-0345>.

**At 18 gender clinics across the country, Reuters found that most do not have stringent protocols to determine whether a patient would be best served by undergoing the life-changing process of transitioning.**

prescribed off-label, meaning that the U.S. Food and Drug Administration (FDA) has not approved them to be used in gender care for children. Their only approved use in that regard is for treating central precocious puberty—when a child begins to go through puberty too early. But they have been controversial from the start.

Take Lupron, the most commonly prescribed puberty blocker. It was conceived by a joint venture between Abbott Laboratories and Takeda Pharmaceutical Co. After that venture was dissolved, Abbott transferred its pharmaceutical division to AbbVie, a spin-off company that has made Lupron since 2013. In 1985, Lupron was approved by the FDA to treat prostate cancer. It works by cutting off the hormones that worsen the condition and results in chemical castration. It was subsequently approved for other uses, including precocious puberty, in 1993. A review of federal records by the Center for Investigative Reporting and Kaiser Health News revealed that the FDA official who approved the drug for use in children had strong reservations about the quality of the supporting evidence.<sup>21</sup> He called its approval “regrettable.” More than 32,000 adverse event reports have been filed with the FDA for Lupron products, including nearly 18,000 serious cases and over 3,000 deaths.<sup>22</sup>

Since 2013, there have been 1,152 adverse event reports for Lupron Depot-Ped, which is used to treat early puberty in pediatric patients and off-label to block puberty to start the process of medicalized gender transitioning. A closer look shows 82 cases of depression, psychotic disorders, emotional distress, and antisocial and suicidal behavior between 2013 and 2023. An investigation by Reuters made similar findings, which alarmed Dr. Brad Miller, division director of pediatric endocrinology at the University of Minnesota Medical School and M Health Ma-

<sup>21</sup> Christina Jewett, “Drug used to halt puberty in children may cause lasting health problems,” STAT News, February 2, 2017, <https://www.statnews.com/2017/02/02/lupron-puberty-children-health-problems/>.

<sup>22</sup> “FDA Adverse Event Reporting System (FAERS) Public Dashboard,” accessed March 10, 2024, <https://fis.fda.gov/sense/app/95239e26-e0be-42d9-a960-9a5f7f1c25ee/sheet/33a0f68e-845c-48e2-bc81-8141c6aaf772/state/analysis>.



sonic Children’s Hospital.<sup>23</sup> Miller and other doctors told Reuters they had repeatedly asked companies like AbbVie to seek FDA approval for drugs used in gender care and to conduct research to establish their safety in that regard. But the companies have always refused. “They would say it would cost a lot of money to get approval,” Miller said. “And they were not interested in going there because (transgender treatment) was a political hot potato.”

Yet medical practitioners remain trigger-happy. At 18 gender clinics across the country, Reuters found that most do not have stringent protocols to determine whether a patient would be best served by undergoing the life-changing process of transitioning. Seven clinics said that, depending on the age of the child, they will begin prescribing puberty blockers based on the first visit if there are no “red flags.” But the red flags in the cases of detransitioners didn’t give anyone pause—in fact, their red flags seemed to rationalize the start of treatment. Adults have also reported being pressed to subject their children to transitioning. Reuters interviewed the parents of 39 minors who had sought “gender-affirming care.” Of that number, 28 said they felt “pressured or rushed to proceed with treatment” for their

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<sup>23</sup> Chad Terhune, Robin Respaut, and Michelle Conlin, “As more transgender children seek medical care, families confront many unknowns,” Reuters, October 6, 2022, <https://www.reuters.com/investigates/special-report/usa-transyouth-care/>.

## POTENTIAL LONG-TERM SIDE EFFECTS OF SEX-TRAIT MODIFICATION HORMONES

Ischemic Stroke

Pulmonary Embolism

STEMI  
(a heart attack with a completely blocked coronary artery)

NSTEMI  
(a heart attack that occurs when a heart's need for oxygen isn't met)

Drug Abuse

Hypothyroidism

Source: Journal of the American College of Cardiology

kids. Some said their children were recommended for puberty blockers after consultations lasting just 15 minutes. Despite so many serious concerns, prescriptions for blockers among minors doubled between 2017 and 2021, according to Komodo Health, a company specializing in products for analyzing medical data.<sup>24</sup> Patrick Brown, a fellow at the Ethics and Public Policy Center, told the Daily Mail that prescriptions for hormone therapy have risen at about the same rate.

The proponents of these drugs insist there is no harm in utilizing them because the effects are reversible if a child decides to stop. But that's problematic for a number of reasons. A study published in *The Lancet* in October 2022 found that most adolescents who start puberty suppression treatment continue along the "gender-affirming care" spectrum into adulthood. Moreover, there are, in fact, lasting side effects.<sup>25</sup>

*The New York Times* commissioned an analysis that examined seven studies from the Netherlands, Canada, and England involving about 500 "transgender teens" from 1998 through 2021.<sup>26</sup> "Researchers observed that while on blockers, the teens did not gain any bone density, on average—and lost significant ground compared to their peers," *The Times* reported. A review commissioned by *The Times* of observational studies found that bone density growth typically flatlines during puberty suppression, which comes with a lifetime of repercussions. Indeed, two studies that tracked bone strength in patients using blockers concluded that many lag behind their peers and do not catch up to them. "That could lead to heightened risk of debilitating fractures earlier than would be expected from normal aging—in their

<sup>24</sup> Luke Andrews, "America's child trans explosion in charts: Gender dysphoria rates and puberty blocker prescriptions among under-18s have DOUBLED since 2017," Daily Mail, December 19, 2022, <https://www.dailymail.co.uk/health/article-11533809/Puberty-blocker-prescriptions-trans-children-DOUBLED-2017-gender-dysphoria-rises.html>.

<sup>25</sup> Maria Anna Theodora Catharina van der Loos et al., "Continuation of gender-affirming hormones in transgender people starting puberty suppression in adolescence: a cohort study in the Netherlands," *The Lancet*, Volume 6, Issue 12, P869-875, December 2022, [https://doi.org/10.1016/S2352-4642\(22\)00254-1](https://doi.org/10.1016/S2352-4642(22)00254-1).

<sup>26</sup> Megan Twohey and Christina Jewett, "They Paused Puberty, but Is There a Cost?" *The New York Times*, November 14, 2022, <https://www.nytimes.com/2022/11/14/health/puberty-blockers-transgender.html>.

50s instead of 60s—and more immediate harm for patients who start treatment with already weak bones,” *The Times* noted. A Texas teenager who went on blockers at age 11 showed osteoporotic levels of bone density in a scan taken a few years later. This is happening everywhere. In Sweden, one “transgender adolescent” who took the drugs from the age of 11 to 14 developed osteoporosis and sustained a compression fracture in his spine. He now suffers from chronic back pain and a “permanent disability”—not reversible—because of the puberty blockers.

All of this is to say nothing of the ramifications concerning neurodevelopment and fertility that might arise from suppressing puberty, which is still only one part of gender care.<sup>27</sup> According to a study published in March in the *Journal of the American College of Cardiology*, people with gender dysphoria on hormone therapy face increased “odds of ischemic stroke, pulmonary embolism, STEMI, NSTEMI, drug abuse, and hypothyroidism.”<sup>28</sup> STEMI is a heart attack with a completely blocked coronary artery; NSTEMI is a heart attack that occurs when a heart’s need for oxygen isn’t met. People with gender dysphoria who used hormones were at nearly seven times the risk of ischemic stroke, nearly six times the risk of heart attack, and nearly five times the risk of pulmonary embolism compared to gender dysphoric people who had never used hormone replacements. An American College of Cardiology press release billed the study as “the largest to date examining the cardiovascular risks of gender affirmation therapy in this historically understudied population.”<sup>29</sup>

And while there is a paucity of data as to the rate of complications that arise from various surgical procedures,

**People with gender dysphoria who used hormones were at nearly seven times the risk of ischemic stroke, nearly six times the risk of heart attack, and nearly five times the risk of pulmonary embolism compared to gender dysphoric people who had never used hormone replacements.**

<sup>27</sup> Diane Chen, “Consensus Parameter: Research Methodologies to Evaluate Neurodevelopmental Effects of Pubertal Suppression in Transgender Youth,” *Transgender Health*, Volume 5, Number 4, 2020, <https://doi.org/10.1089/trgh.2020.0006>.

<sup>28</sup> Ibrahim Ahmed, “Cardiovascular Outcomes in Gender Dysphoric Patients Undergoing Hormone Replacement Therapy,” *Journal of the American College of Cardiology*, Volume 81, Issue 8, Supplement A, March 7, 2023, <https://www.jacc.org/doi/10.1016/S0735-1097%2823%2902110-1>.

<sup>29</sup> “Hormone Therapy for Gender Dysphoria May Raise Cardiovascular Risks,” *American College of Cardiology*, February 23, 2023, <https://www.acc.org/About-ACC/Press-Releases/2023/02/22/2029/Hormone-Therapy-for-Gender-Dysphoria-May-Raise-Cardiovascular-Risks#:~:text=People%20with%20gender%20dysphoria%20taking,Cardiology%20Annual%20Scientific%20Session%20Together>.

**While some aspects of “gender-affirming care” are less risky than others, the fact is that there is an alarming knowledge gap about the complications and long-term consequences of these treatments.**

some of what we do know does not look good. Take the double flap phalloplasty, which uses flesh, typically from the forearm, to construct a “penis” for “transgender men.” One study published in *Microsurgery* reported complications as high as 53 percent.<sup>30</sup> Researchers in another medical journal, *Current Urology*, cited different studies that show “urethral complications scaling between 25% and 75% following masculinizing gender-affirming surgery.” While some aspects of “gender-affirming care” are less risky than others, the fact is that there is an alarming knowledge gap about the complications and long-term consequences of these treatments. The following paragraph from Mosley’s lawsuit should throw cold water on the idea that any of this can simply be “reversed” with the ease of flipping a light switch:

Prisha has experienced, and expects to continue to experience, pain and suffering and emotional distress as a result of living in a body that has not developed the way it should have, with a voice she is unable to lift up and with which she is unable to sing, without her breasts and the ability to nurse a child, with shoulders that are too broad and heavy and a waist and hips that are too small and narrow, without her natural hair growth and with unwanted and unnatural body hair growth, with vaginal atrophy, and potentially without the ability to conceive a child.<sup>31</sup>

Britain’s National Health Service banned puberty-blocking drugs for minors experiencing gender confusion in March. A doctor said it was “not possible to accurately track the outcomes and pathways that children and young people take through the service” while using these drugs.<sup>32</sup> The risks outweighed the available evidence.

<sup>30</sup> Wouter B van der Sluis, “Double flap phalloplasty in transgender men: Surgical technique and outcome of pedicled anterolateral thigh flap phalloplasty combined with radial forearm free flap urethral reconstruction,” *Microsurgery*. 2017 Nov;37(8):917-923. DOI: 10.1002/micr.30190. Epub 2017 May 29. PMID: 28556461; PMCID: PMC5697604.

<sup>31</sup> Prisha Mosley v. Eric T. Emerson, [https://first-heritage-foundation.s3.amazonaws.com/live\\_files/2023/07/Prisha-Mosley-File-Stamped-Complaint-7.17.23.pdf](https://first-heritage-foundation.s3.amazonaws.com/live_files/2023/07/Prisha-Mosley-File-Stamped-Complaint-7.17.23.pdf).

<sup>32</sup> “Children to No Longer Be Prescribed Puberty Blockers, NHS England Confirms,” *Sky News*, April 14, 2024, <https://news.sky.com/story/children-to-no-longer-be-prescribed-puberty-blockers-nhs-england-confirms-13093251>.



# THE GENDER MARKET

We know two things for certain at this point: there is little hard evidence in support of medicalized transitioning, and the demand for treatment is increasing. Why? Part of the problem is that a kind of quasi-religious belief accompanies the proliferation of transgenderism. We are essentially proceeding on “faith” that normalizing these procedures will do more good than harm in lieu of serious data. But that is not the whole picture. There lurks beneath the surface of “best practices” an incentive structure and a market, both real and potential. The religiosity about transgenderism seems to blind people to these realities. Consider that in 2012 Abbott Laboratories, which spawned AbbVie, paid \$1.5 billion to settle accusations that it had promoted a drug for uses not approved by the FDA.<sup>33</sup> Then, in 2018, Abbott and AbbVie agreed to pay \$25 million to resolve allegations of employing kickbacks and unlawful marketing methods to induce physicians to prescribe TriCor, a cholesterol drug.<sup>34</sup> Most recently, AbbVie paid \$2.7 million to settle a lawsuit accusing the company of using kickbacks to incentivize Humira prescriptions.<sup>35</sup> Yet the gender industry remains above all suspicion of greed and corruption.



<sup>33</sup> “AbbVie,” Dollars for Doctors, ProPublica, accessed April 10, 2024, <https://projects.propublica.org/d4d-archive/companies/abbvie>.

<sup>34</sup> “Abbott Laboratories and AbbVie Inc. to Pay \$25 Million to Resolve False Claims Act Allegations of Kickbacks and Off-Label Marketing of the Drug TriCor®,” Dollars for Doctors, U.S. Attorney’s Office, Eastern District of Pennsylvania, accessed April 10, 2024, <https://www.justice.gov/usao-edpa/pr/abbott-laboratories-and-abbvie-inc-pay-25-million-resolve-false-claims-act-allegations>.

<sup>35</sup> Katie Buehler, “AbbVie Inks \$2.7M Deal To End Humira FCA Kickback Battle,” Law360, March 21, 2023, <https://www.law360.com/articles/1588461/abbvie-inks-2-7m-deal-to-end-humira-fca-kickback-battle>.

# TOP PHARMACEUTICAL PRODUCERS AND SURGICAL PROVIDERS IN THE GENDER MARKET

SURGICAL		PHARMACEUTICAL
Cedars Sinai	Cleveland Clinic	Pfizer Inc.
Regents of the University of Michigan	CNY Cosmetic & Reconstructive Surgery	AbbVie Inc.
Mount Sinai Health System	Transgender Surgery Institute	Endo International plc
Kaiser Permanente	The Johns Hopkins University	Novartis AG
Mayo Clinic (Transgender and Intersex Specialty Care Clinic)	University of California, San Francisco Center of Excellence for Transgender Health	Lilly (Eli Lilly)
New York Presbyterian Hospital		

Source: Grand View Research. For more, see appendix.

Determining just how many people, including minors, identify as transgender and are seeking “gender-affirming care” is a difficult task for myriad reasons. However, confronting this question is a key step in understanding the scope of the problem with an eye toward justice and compensation for victims who were hurried along the transition roadmap by people they trusted to do no harm.

In the autumn of 2022, Reuters partnered with Komodo to investigate how many young people have sought and obtained “gender-affirming care.”<sup>36</sup> This pioneering analysis was the first of its kind. Komodo needed to sift through its enormous database of U.S. insurance claims and other medical records on approximately 330 million Americans. Komodo concluded that at least 121,882 children ages 6 to 17 were diagnosed with gender dysphoria from 2017 through 2021. Of that number, 17,683 U.S. children began using puberty blockers or hormones during that period. Over 42,000 of those children were diagnosed in 2021 alone—an increase of 70 percent from 2020. But here is an important caveat: “This tally and others in the Komodo analysis are likely an undercount because they didn’t

<sup>36</sup> Terhune, Respaut, and Conlin, “As more transgender children seek medical care, families confront many unknowns,” Reuters.

include treatment that wasn't covered by insurance and were limited to pediatric patients with a gender dysphoria diagnosis. Practitioners may not log this diagnosis when prescribing treatment."<sup>37</sup>

Indeed, the Williams Institute on Sexual Orientation and Gender Identity Law and Public Policy reported in June 2022 that more than 1.6 million adults (ages 18 and older) and youth (ages 13 to 17) identify as transgender in the United States.<sup>38</sup> About 300,000 fall into the 13-17 category.<sup>39</sup> If any of these otherwise qualifying people were not covered by insurance or were not, for whatever reason, diagnosed with gender dysphoria before receiving treatment, they would be invisible to Komodo. Nor would the company be able to see, for instance, those individuals who started puberty blockers that they acquired online through the gray market of unregulated suppliers.<sup>40</sup> Clearly, this data is extremely difficult to compile and analyze.

Still, Komodo's analysis provides an important snapshot, the tip of an iceberg toward which we are sailing blindfolded. It underscores the speed at which gender confusion, as a social and peer contagion, is spreading among Americans and America's youth especially. And that, of course, is accompanied by and symbiotically connected to a burgeoning gender industry with incentives for administering these treatments as access to them is mainstreamed and liberalized. In New York, for example, Gov. Kathy Hochul's administration has moved to put public dollars toward streamlining "gender-affirming care." Hochul's Health Department awarded \$500,000 in new contracts for "The Transgender Clinical Scholars Training Pilot Program" to Mount Sinai Hospital, plus additional funding to Community Health Care Project-Callen Lorde

**The Reuters-Komodo analysis underscores the speed at which gender confusion, as a social and peer contagion, is spreading among Americans and America's youth especially.**

<sup>37</sup> Ibid.

<sup>38</sup> Jody L. Herman, Andrew R. Flores, Kathryn K. O'Neill, "How Many Adults and Youth Identify as Transgender in the United States?", Williams Institute on Sexual Orientation and Gender Identity Law and Public Policy, June 2022, <https://williamsinstitute.law.ucla.edu/wp-content/uploads/Trans-Pop-Update-Jun-2022.pdf>.

<sup>39</sup> "New Estimates Show 300,000 Youth Ages 13-17 Identify as Transgender in the US," Williams Institute, June 10, 2022, <https://williamsinstitute.law.ucla.edu/press/transgender-estimate-press-release/>.

<sup>40</sup> Becky McCall, "How Widespread Is Use of Transgender Hormones Bought Online?", Medscape, January 7, 2019, <https://www.medscape.com/viewarticle/907318?form=fpf>.

**At present, 26 states have Medicaid policies that explicitly cover transgender-related health care. The Williams Institute estimates that approximately 276,000 of the 1.3 million adults who identify as transgender are enrolled in Medicaid.**

Health Center in Manhattan, and Mary Imogene Bassett Hospital in Cooperstown.<sup>41</sup> The program will train and prepare already licensed clinicians to support patients initiating or undergoing the process of transitioning. In 2021 alone, the Mount Sinai Center for Transgender Medicine and Surgery performed 861 surgeries.<sup>42</sup>

At present, 26 states have Medicaid policies that explicitly cover transgender-related health care.<sup>43</sup> Puerto Rico and the District of Colombia do as well. The Williams Institute estimates that approximately 276,000 of the 1.3 million adults who identify as transgender are enrolled in Medicaid.<sup>44</sup> Of that number, 60 percent have affirmative access to coverage for “gender-affirming care” under policies in state law. Exactly how many people are using Medicaid to receive some form of gender care is unclear. But Komodo’s analysis of insurance claims found “top surgery,” or breast removal, is the most common among teens. At least 776 mastectomies were performed on Americans ages 13 to 17 with a prior gender dysphoria diagnosis from 2019 to 2021, according to Komodo.<sup>45</sup> The cost for the procedure ranges from \$6,000 to \$10,000.<sup>46</sup> That excludes consultation fees, hidden fees, medical supplies, and so on.

As previously mentioned, increased rates of gender dysphoria are driving increased demands for these expensive treatments. One study published in JAMA Net-

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<sup>41</sup> Carl Campanile, “NYS Provides \$500K Funding to Mt. Sinai, Others for Transgender Medical Care Pilot Program as Critics Cry ‘Morally Irresponsible,’” June 21, 2023, <https://nypost.com/2023/06/20/nys-provides-500k-funding-to-mt-sinai-others-for-transgender-medical-care-pilot-program-as-critics-cry-morally-irresponsible/>.

<sup>42</sup> “Mount Sinai Center for Transgender Medicine and Surgery,” Mount Sinai, accessed November 3, 2023, <https://www.mountsinai.org/files/MSHealth/Assets/HS/Locations/CTMS/CTMS-2021-Annual-Report.pdf>.

<sup>43</sup> “Medicaid Coverage of Transgender-Related Health Care,” Movement Advancement Project, accessed April 10, 2024, <https://www.lgbtmap.org/equality-maps/medicaid>.

<sup>44</sup> Christy Mallory and Will Tentindo, “Medicaid Coverage for Gender-Affirming Care,” Williams Institute, December 2022, <https://williamsinstitute.law.ucla.edu/wp-content/uploads/Medicaid-Gender-Care-Dec-2022.pdf>.

<sup>45</sup> Robin Respaut and Chad Terhune, “Number of transgender children seeking treatment surges in U.S.,” Reuters, October 6, 2022, <https://www.reuters.com/article/usa-transyouth-data/number-of-transgender-children-seeking-treatment-surges-in-u-s-idUKL1N3142UU#>.

<sup>46</sup> “Find out How Much Top Surgery Costs,” TopSurgery.net, accessed November 3, 2023, <https://www.topsurgery.net/costs/#:~:text=In%20general%2C%20the%20cost%20of,hidden%20fees%20and%20medical%20supplies.>



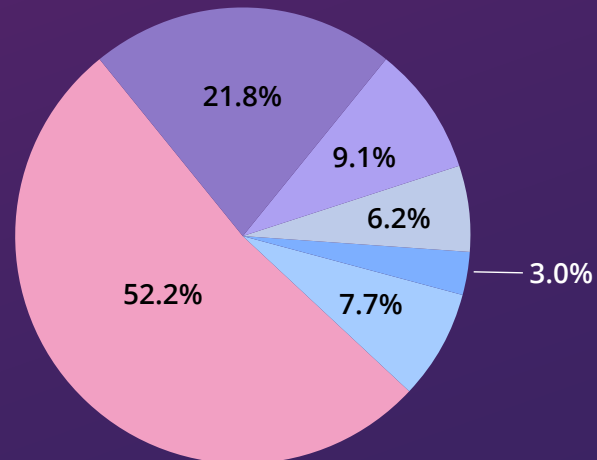
work Open found that “gender-affirming surgeries” (GAS) conducted in the United States nearly tripled between 2016 and 2019.<sup>47</sup> As with Komodo, this analysis broke new ground despite methodological difficulties.

Researchers looked at records from 2016 to 2020 from the Nationwide Ambulatory Surgery Sample (NASS), the only all-payer surgery database in the United States that tracks qualifying same-day operations. “The ambulatory surgeries selected for inclusion in the NASS are therapeutic procedures which require the use of an operating room, penetrate or break the skin, and involve regional anesthesia, general anesthesia, or sedation to control pain,” the website reads.<sup>48</sup> Researchers focused on diagnosis codes for “gender identity disorder” or “transsexualism” or a personal history of sex reassignment. Under these parameters, they identified 48,019 patients and a

<sup>47</sup> Jen Christensen et al., “National Estimates of Gender-Affirming Surgery in the US,” August 23, 2023, <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2808707>.

<sup>48</sup> “NASS Overview,” Agency for Healthcare Research and Quality, accessed November 3, 2023, <https://hcup-us.ahrq.gov/nassoverview.jsp>.

# SEX-TRAIT MODIFICATION SURGERIES PERFORMED BY AGE GROUP, 2016-2020



Source: JAMA Network Open

■ 12-18 yrs ■ 19-30 yrs ■ 31-40 yrs ■ 41-50 yrs ■ 51-60 yrs ■ 61 and older

“remarkable increase” in the number of GAS procedures performed over time. Overall:

- 25,099 patients (52.3 percent) were aged 19 to 30
- 10,476 (21.8 percent) were aged 31 to 40
- 3,678 (7.7 percent) were aged 12 to 18 years

Health system encounters for gender identity disorder rose from 13,855 in 2016 to 38,470 in 2020. They also found that among encounters with a billing code for gender identity disorder, there was “a consistent rise in the percentage that were for GAS” from 4,552 (32.9 percent) in 2016 to 13,011 (37.1 percent) in 2019. There occurred a brief decline in 2020 due to COVID-19. The most common procedures were as following:

- Breast and chest procedures: 27,187 patients (56.6 percent)
- Genital reconstruction: 16,872 patients (35.1 percent)
- Other facial and cosmetic procedures: 6,669 patients (13.9 percent)

Now here is another caveat. Dr. Devin Coon, a board-certified plastic surgeon in the Division of Plastic Surgery at Brigham and Women’s Hospital and an associate professor of surgery at Harvard, told CNN after reviewing this analysis that the figures are likely undercounted. “It’s very easy to say who had a knee replacement. It is not

like that for gender-affirming surgeries,” Coon said.<sup>49</sup> He noted the inherent difficulties of attempting to identify GAS patients based on procedure codes. Nevertheless, he concluded that the general picture appears true to life. “It is reasonable to look at the study, though, and say the trends in here are probably reflective of the overall trends,” Coon said.

But is it possible to put an overall dollar sign on all the relevant treatments and procedures combined? The American Principles Project commissioned a market analysis by Grand View Research, a business consulting firm, to shed some light on that question.

Grand View Research examined two broad, interlocking parts of the gender industry: surgery and hormone therapy. The former includes everything from mastectomies and scrotoplasty to voice feminization, where the vocal folds are altered to achieve a higher pitch and thus a more feminine voice. It also examined how some of the key players are profiting.

According to its analysis, the sex-reassignment surgery market size was \$4.12 billion in 2022. That is expected to grow at a compound annual growth rate of 8.4 percent from 2023 to 2030. Consistent with Komodo’s analysis, mastectomies dominated the surgery market with the largest revenue share in 2022. Meanwhile, estrogen had the largest revenue share of the hormone market.

The fact that many of the drugs utilized in the process of transitioning are prescribed off-label makes it difficult to determine exactly how much revenue is generated specifically from their use in “gender-affirming care.” However, Grand View Research was able to generate estimates of how much money is being made by companies that offer these services and thus utilize these products. The figures were produced based on an in-house estimation model that considered criteria such as market presence, service offering, locations, overall revenue, strategic initiatives, and state regulations.

<sup>49</sup> Jen Christensen, “Gender-Affirming Surgeries in US Nearly Tripled from 2016 to 2019, Study Finds,” CNN, August 23, 2023, <https://www.cnn.com/2023/08/23/health/gender-affirming-surgery-study/index.html>.

## ESTIMATED SEX-TRAIT MODIFICATION REVENUE OF TOP SURGICAL AND PHARMACEUTICAL PROVIDERS (USD MILLION)

SURGICAL	
Cedars Sinai	\$205.70
Regents of the University of Michigan	\$152.90
Mount Sinai Health System	\$152.90
Kaiser Permanente	\$120.20
Mayo Clinic (Transgender and Intersex Specialty Clinic)	\$116.30
University of California, San Francisco Center of Excellence for Transgender Health	\$112.50
Cleveland Clinic	\$97.60
CNY Cosmetic & Reconstructive Surgery	\$97.50
Transgender Surgery Institute	\$95.10
The Johns Hopkins University	\$95.10
New York Presbyterian Hospital	\$75.10
PHARMACEUTICAL	
Pfizer Inc.	\$74.17
AbbVie Inc.	\$51.60
Endo International	\$46.76
Novartis AG	\$33.86
Lilly (Eli Lilly)	\$28.22

Source: Grand View Research. For more, see appendix.

**Cedars-Sinai Medical Center in Los Angeles was among the top groups for market revenue derived from sex-reassignment surgery.**

At just over \$205 million in 2022, Cedars-Sinai Medical Center in Los Angeles was among the top groups for market revenue derived from sex-reassignment surgery.

In 2016, Mount Sinai became the first organization in New York City to offer these surgeries. According to this analysis, the Mount Sinai market revenue share in 2022 was \$136 million. In its 2021 annual report, the Mount Sinai Center for Transgender Medicine and Surgery indicated that approximately 41.7 percent of the “transfeminine” population aged 25 to 34 and 25.8 percent aged 15 to 24 underwent sex-reassignment surgery.

Grand View Research also estimated hormone therapy product revenues for manufacturers, such as AbbVie. According to this analysis, which comes with inherent limitations, AbbVie’s “gender-affirming care” revenue share for puberty blockers, estrogen, and testosterone in 2022 was \$51.6 million. The firm anticipates that the market for “gender-affirming” hormone treatments is expected to experience “significant growth” as the availability of these services increases.





# KNOWN UNKNOWNNS

In 2002, United States Secretary of Defense Donald Rumsfeld introduced the public to an analytical technique called the Johari window. It was developed by two psychologists in the 20<sup>th</sup> century but has been adapted for applications outside the field. Most people remember it as Rumsfeld’s “unknown unknowns” moment. Commenting on the lack of evidence behind allegations that the Iraqi government had supplied weapons of mass destruction to terrorist groups, he said:

Reports that say that something hasn’t happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns—the ones we don’t know we don’t know. And if one looks throughout the history of our country and other free countries, it is the latter category that tends to be the difficult ones.<sup>50</sup>

To borrow from Rumsfeld, what are the known knowns, known unknowns, and unknown unknowns of the “gender-affirming care” industry?

We know that, according to Grand View Research, the industry as a whole was worth just over \$4 billion in 2022. However, we also know that this analysis is incomplete. As is the case with the Komodo analysis, we know there are inherent limitations to what kind of patient and provider data can be gathered and reviewed. We know that Komodo



<sup>50</sup> Donald H. Rumsfeld, “DoD News Briefing,” February 12, 2002, <https://web.archive.org/web/20160406235718/http://archive.defense.gov/Transcripts/Transcript.aspx?TranscriptID=2636>.

**Dr. Shayne Taylor, a physician at the Vanderbilt Clinic for Transgender Health, indicated in 2018 the profit potential of the industry. In addition to large sums for the surgery itself, hospitals profit off the pre-op visits, labs, post-op visits, anesthesia, OR, and more.**

does not know about patients who underwent treatment without insurance or were not diagnosed beforehand. We know the study published in JAMA Network Open cannot know about patients who received treatment without the relevant codes. So that leaves us with the unknown unknowns. We don't know what we don't know, so we have to get creative. We have to think outside the box, starting with the assumption that the market is likely, or could be, much bigger than \$4 billion. Dr. Shayne Taylor, a university professor and a physician at the Vanderbilt Clinic for Transgender Health, gives us good reason to suspect that.

Vanderbilt University Medical Center launched its Transgender Health Clinic in 2018. That was no easy feat in a Southern state dominated by Republican politics. But the skids got greased when Taylor told Nashville about the clinic's profit potential. She said during a lecture the same year the facility opened its doors that "gender-affirming care" is "a big money maker." After all, patients are repeat and often lifelong customers. Taylor explained:

These surgeries make a lot of money. So, female-to-male chest reconstruction could bring in \$40,000. A patient just on routine hormone treatment, who we're only seeing a few times a year, can bring in several thousand dollars because it requires lots of visits and labs that actually makes money for the hospital. Now, these I got from the internet, but it's from the Philadelphia Center for Transgender Surgery, which has—does a lot of surgery for patients. I just wanted to give you an idea of how much these bottom surgeries are making. And this is—I think this has to be an underestimate. This is for vaginoplasty, they're saying, they're quoting roughly around \$20,000 for a vaginoplasty, but that doesn't include your hospital stay, that doesn't include your post-op visits, that doesn't include your anesthesia, your OR. So I would think this has to be a gross underestimate. I think that's just, like, the surgeon's piece of it.<sup>51</sup>

<sup>51</sup> Shayne Taylor, "Dr. Shayne Taylor on Gender Transition: These Surgeries Make a Lot of Money," Grabien, September 21, 2022, <https://news.grabien.com/story/dr-shayne-taylor-on-gender-transition-these-surgeries-make-a-lot-of-mo>.

It worked. The clinic didn't just open. Taylor grew the number of patients from just 1 to over 2,000 in four years.

Taylor's reference to the Philadelphia Center for Transgender Surgery is notable. In October 2023, the Pennsylvania Family Institute reported that over \$20 million in state taxpayer dollars had been used to subsidize "gender-affirming care" for minors since 2015.<sup>52</sup> The fact this information was obtained through a Right-To-Know Request with the Pennsylvania Department of Human Services raises the question of whether it would have appeared in any of the aforementioned analyses.

According to the institute, the Keystone State was spending almost \$14,000 per day in 2022 on transgender services and surgeries. "From 2015 to 2022, Pennsylvania has had a more than 8,200 percent increase in taxpayer funding for these drugs, surgeries, and services through these state insurance programs for children," the institute states. The spigot opened after Pennsylvania hospitals lobbied to expand state coverage of "gender-affirming care" in 2015. The following year, the Pennsylvania Department of Human Services announced the state Medicaid program would cover all related services. And this is where we return to trying to understand what we can't see.<sup>53</sup>

Tennessee Gov. Bill Lee launched an investigation into Vanderbilt's transgender clinic in September 2022. There was confusion as to what exactly sparked the inquiry. According to Attorney General Jonathan Skrmetti, it wasn't the lecture in which Taylor discussed just how profitable transgenderism can be. Instead, Skrmetti told NewsChannel 5 that the impetus was Taylor's comments in a separate video from 2019 about manipulating billing codes to get paid by insurance companies that won't cover "gender-affirming care."

<sup>52</sup> "Shocking new report reveals PA government spent more than \$20 million on transgender surgeries and services for minors," Pennsylvania Family Institute, October 23, 2023, <https://pafamily.org/2023/10/23/shocking-new-report-reveals-pa-government-spent-more-than-20-million-on-transgender-surgeries-and-services-for-minors/>.

<sup>53</sup> "Pennsylvania Medicaid Removes Trans Health Exclusions!" National Center for Transgender Equality Image, July 20, 2016, <https://transequality.org/blog/pennsylvania-medicaid-removes-trans-health-exclusions>.

## STATE FUNDING FOR THE GENDER INDUSTRIAL COMPLEX

*Pennsylvania Case Study*

**\$20 MILLION**

in taxpayer dollars for transgender services for minors from 2015 to 2023

**8,200%**

increase in taxpayer funding for transgender drugs, surgeries, and services from 2015 to 2022

**\$14,000**

per day spent by taxpayers in 2022 on transgender services and surgeries

Source: Pennsylvania Family Institute

## THE PROFIT POTENTIAL OF THE GENDER INDUSTRIAL COMPLEX

**1.4 MILLION**

transgender-identifying people

**X**

**\$150,000**

minimum cost for transition

**=**

**\$200+ BILLION**

potential industry market size

Source: Robbi Katherine Anthony, CEO of Euphoria

firming care.”<sup>54</sup> In that video, Taylor said: “So for the patient who gets a big bill because their insurance doesn’t cover any transgender-related codes I usually write ‘endocrine disorder not otherwise specified’ to allow me to order the labs that I want.”

As far as Skrmetti is concerned, this is a run-of-the-mill fraud investigation. “The government is allowed to set limits on what is going to be reimbursed, private companies are allowed to set limits on what’s going to be reimbursed,” he said. “And if a doctor, in the coding process, uses a code that is not the most accurate code for the explicit purpose of avoiding those limitations, they are trying to get money that they are not owed.” That’s all true. But it also shows just how much is happening under the radar and why virtually every attempt to quantify the size of the gender market yields a conservative estimate. A study published in *Medical Care*, an official journal of the American Public Health Association, noted that large administrative databases “often do not capture gender identity data, limiting researchers’ ability to identify transgender people and complicating the study of this population.”<sup>55</sup> The authors retrospectively analyzed administrative claims data for insured adults using two strategies to improve the accuracy of identifying transgender people. They had initially used “gender identity disorder” diagnoses codes to identify transgender people in administrative data. In their retrospective analysis, they looked for “endocrine disorder not otherwise specified” (Endo NOS) codes—which is what Taylor discussed using—and a transgender-related procedure code. They also looked for receipt “of sex hormones not associated with the sex recorded in the patient’s chart (sex-discordant hormone therapy) and an Endo NOS code or transgender-related procedure code.” The researchers identified thousands

<sup>54</sup> Phil Williams, “REVEALED: Vanderbilt transgender clinic investigation sparked by doctor’s video, Tennessee AG says,” NewsChannel5, August 2, 2023, <https://www.newschannel5.com/news/newschannel-5-investigates/revealed-vanderbilt-transgender-clinic-investigation-sparked-by-doctors-video-tennessee-ag-says>.

<sup>55</sup> Guneet K. Jasuja et al., “Beyond Gender Identity Disorder Diagnoses Codes: An Examination of Additional Methods to Identify Transgender Individuals in Administrative Databases,” *Medical Care* 58(10):p 903-911, October 2020, DOI: 10.1097/MLR.0000000000001362.

more transgender-identified patients through this method but found many others who could not be classified.

Given all these inherent difficulties and blind spots, all the known unknowns and unknown unknowns, we can see how the gender market easily has the potential to be much larger than a few billion dollars.

Let's assume the Williams Institute is correct that there are roughly 300,000 people between the ages of 13 and 17 who identify as transgender. Based on data from the Philadelphia Center for Transgender Surgery,<sup>56</sup> the cost of fully transitioning ranges from \$124,000<sup>57</sup> to \$140,450.<sup>58</sup> Taking the smaller number and multiplying it by 300,000 still yields a market in excess of \$37 billion. Yet even that number would seem conservative to some transgender activists. In an interview with Forbes, Robbi Katherine Anthony (who prefers going by RKA), the CEO of transition tech company Euphoria, said the sex-reassignment market could be as big as \$200 billion.<sup>59</sup>

“Our estimates place the average cost of transition at \$150,000 per person. Multiply that by an estimated population of 1.4 million transgender people, we're taking [sic] about a market in excess of \$200B. That is significant,” RKA told Forbes. “That's larger than the entire film industry.”

The \$1.4 million figure RKA cited appears to have been drawn from a Williams Institute study published in 2016.<sup>60</sup> The institute released the latest figure of 1.6 million



<sup>56</sup> Alyssa Jackson, “The high cost of transgender,” CNN, July 31, 2015, <https://www.cnn.com/2015/07/31/health/transgender-costs-irpt/index.html>.

<sup>57</sup> “Female to Male Price List,” The Philadelphia Center for Transgender Surgery, accessed April 16, 2024, <https://web.archive.org/web/20221206191034/http://www.thetransgendercenter.com/index.php/femaletomale1/ftm-price-list.html>.

<sup>58</sup> “Male to Female Price List,” The Philadelphia Center for Transgender Care, accessed April 16, 2024, <https://web.archive.org/web/20201001004804/http://www.thetransgendercenter.com/index.php/mtf-price-list.html>.

<sup>59</sup> Alyssa Wright, “Trans-Tech Is A Budding Industry: So Why Is No One Investing In It?” Forbes, December 8, 2020, <https://www.forbes.com/sites/alyssawright/2020/12/08/trans-tech-is-a-budding-industry-so-why-is-no-one-investing/?sh=1aa98989e3c3>.

<sup>60</sup> Bill Chappell, “1.4 Million Adults Identify As Transgender In America, Study Says,” NPR, June 30, 2016, <https://www.npr.org/sections/thetwo-way/2016/06/30/484253324/1-4-million-adults-identify-as-transgender-in-america-study-says>.

Any analysis of the current or potential market size would not include visits to the emergency room, costs arising from conditions and complications related to transitioning, revision surgeries, and so on.

trans-identified individuals in 2022, two years after RKA's interview with Forbes. In other words, that already massive market potential has only grown.

It is important to keep in mind that any analysis of the current or potential market size would not include visits to the emergency room, costs arising from conditions and complications related to transitioning, revision surgeries, and so on. For example, a study in the medical journal *Plastic and Reconstructive Surgery* found that up to a third of patients “undergo secondary surgical revision to address functional and aesthetic concerns after penile inversion vaginoplasty.”<sup>61</sup> A similar study in *Aesthetic Plastic Surgery* reported that revisions for transfeminine vaginoplasty are frequent.<sup>62</sup> These are lifetime, repeat customers, and there are more of them all the time. According to a Definitive Health report published in January 2024,<sup>63</sup> gender dysphoria diagnoses rose in nearly every U.S. state between 2018 and 2022.<sup>64</sup> The report also noted that 84 percent of respondents to a survey conducted by the National Center for Transgender Equality said they “liked the idea of using gender-affirming hormone therapy,” while 55 percent were actively using hormones. Surgeries, too, are on the rise, and, according to the authors, “over the last two years, the share of patients paying for gender-affirming surgeries with Medicaid and other government plans has gone up.”

Going a layer deeper, we find the burgeoning transition tech industry, of which people like RKA are a part. Although it has received little attention (for example, it does not factor into the Grand View Research analysis), this sector

<sup>61</sup> Martin P. Morris et al., “Common Revisions after Penile Inversion Vaginoplasty: Techniques and Clinical Outcomes,” *Plastic and Reconstructive Surgery* 149(6):p 1198e-1201e, June 2022, DOI: 10.1097/PRS.0000000000009159.

<sup>62</sup> Mañero I, Arno AI, Herrero R, Labanca T, “Cosmetic Revision Surgeries after Transfeminine Vaginoplasty,” *Aesthetic Plast Surgery*, 2023 Feb;47(1):430-441, DOI: 10.1007/s00266-022-03029-9.

<sup>63</sup> Alex Card and Rachel Kolbin-Gupp, “Transgender patients are increasingly seeking care—even as bans spread,” Definitive Healthcare, January 2024, [https://web.archive.org/web/20240111190536/https://www.definitivehc.com/sites/default/files/resources/pdfs/Transgender%20patients%20are%20increasingly%20seeking%20care\\_even%20as%20bans%20spread-January%202024.pdf](https://web.archive.org/web/20240111190536/https://www.definitivehc.com/sites/default/files/resources/pdfs/Transgender%20patients%20are%20increasingly%20seeking%20care_even%20as%20bans%20spread-January%202024.pdf).

<sup>64</sup> ALEX Fitzpatrick and Kavya Beheraj, “Report retracted: Gender dysphoria diagnoses are rising nationwide,” *Axios*, February 14, 2024, <https://www.axios.com/2024/01/11/gender-dysphoria-statistics-us-map>.



is well-funded, supported by powerful people, and streamlining the transitioning process.

Take Euphoria, which bills itself as the “Adobe equivalent” for gender transition. In 2021, Euphoria raised more than \$250,000 in funding.<sup>65</sup> Among its prominent backers were Chelsea Clinton and LGBTQ venture capital firm Gaingels, which has raised more than \$800 million.<sup>66</sup> Euphoria digitally escorts users through transitioning with a suite of apps: Bliss, Solace, and Devotion. Bliss is a financial planning app that helps users save money for expenses related to transitioning. Solace provides resources “to guide transgender people through whatever process of gender transition they desire.” RKA calls it a “compendium for gender transition,” with information on everything from how to change your name to how to get health insurance coverage.<sup>67</sup> Devotion offers “affirmation” messages based on user data. Bliss and Devotion are available to users ages

<sup>65</sup> Ellen Glover, “Meet Euphoria, a New Trans-Focused App Backed by Chelsea Clinton, Others,” Built In Austin, February 17, 2021, <https://www.builtinaustin.com/2021/02/17/euphoria-raises-250k-robby-katherine-anthony>.

<sup>66</sup> “Our Portfolio Companies,” Gaingels, accessed April 16, 2024, <https://gaingels.com/#homePortfolio>.

<sup>67</sup> Jon Jackson, “A Chelsea Clinton-Backed Transgender App Is Stirring Up Debate on Twitter,” Newsweek, March 2, 2021, <https://www.newsweek.com/chelsea-transgender-app-1572204>.



four and up. Solace is available for 17-year-olds to download. It features a “child mode” for “parents and guardians to use on behalf of their child.”

Euphoria’s apps are free, though Solace offered a “set of premium services” for a monthly subscription.<sup>68</sup> Transgender telehealth companies such as Plum, Folx, and equalityMD are driven by the subscription model. Like Euphoria, they represent a segment of the market that remains unquantified.

Plum charges up to \$99 per month for access to healthcare by “a licensed medical provider who is an expert in trans healthcare.” It also facilitates drug prescriptions, labs, telehealth appointments, and more. The monthly fee does not cover the cost of prescriptions. EqualityMD starts its subscription service at \$79 per month, which gets users access to therapists, doctors, and nurses certified with “cultural competency training” through the National LGBTQIA+ Health Education Center at the Fenway Institute. Folx offers a comprehensive price list that states at the top: “All costs below do not include your \$39.99 monthly membership.”<sup>69</sup> It shows that an estradiol patch can cost between \$175 and \$582 every 90 days.

Transgender telehealth and tech were, until recently, uncharted waters. Nevertheless, it has already attracted significant amounts of cash. In 2021, Plum and Folx raised \$14 million and \$25 million in Series A venture capital funding.<sup>70</sup> Folx celebrated by boasting that it was the “first national venture-backed queer and trans brand.” That might have been true then. But Folx won’t be the last, for the simple reason that the market for transgender medicine is huge and only promises to grow in ways known and unknown. Transgender tech, for example, raises questions about data mining, which can also be lucrative.

<sup>68</sup> Jens Skolnik, “Trans Liberation? There’s No App for That,” *Harper’s Bazaar*, April 12, 2021, <https://www.harpersbazaar.com/culture/features/a36097675/trans-liberation-theres-not-an-app-for-that/>.

<sup>69</sup> “Primary Care Services,” *Folx Health*, accessed April 16, 2024, <https://www.folxhealth.com/price-list>.

<sup>70</sup> Ellen Glover, “Meet Euphoria, a New Trans-Focused App Backed by Chelsea Clinton, Others,” *Bult In Austin*, February 17, 2021, <https://www.builtinaustin.com/articles/euphoria-raises-250k-robby-katherine-anthony>.



# MEDICAL MALPRACTICE

Transition therapy is on the rise in the U.S. even as it is curtailed elsewhere because of the market dynamics and incentives unique to this country. Healthcare is mostly run as a for-profit private enterprise in America, and transgenderism is profitable and only promises to be more so with time. Moreover, medical practitioners will continue recommending and administering blockers, hormones, and surgeries as long as they feel safe from liability.

But rolling back the clock on alleged medical progress is not impossible. It was not so long ago that the prefrontal leucotomy, or lobotomy, was considered a medical miracle. It shares many parallels with transgender medicine.

The lobotomy emerged from the field of experimental neurology at Yale, pioneered by a physiologist named John Farquhar Fulton in the 1930s. After removing the frontal lobes of monkeys, he observed that they became so docile and indifferent that he said it “was as though they had joined a happiness cult.”<sup>71</sup>

Egas Moniz, a Portuguese neurologist, believed it was possible to do to humans what Fulton had done to apes. Moniz developed the leucotome, a steel instrument used to sever the connections to the frontal lobe. A series of tests involving patients suffering from schizophrenia ensued. The prefrontal leucotomy was found to be an effective treatment for that and other mental disorders, like depression. Moniz would later win a Nobel Prize for his work.

However, it was the American neurologist Walter Jackson Freeman II who popularized lobotomies as a psychiatric treatment. Freeman was a founder of the American Board of Psychiatry and Neurology. Today, the board instructs



<sup>71</sup> Øivind Torkildsen, “Lessons to be learnt from the history of lobotomy,” *Tidsskr Nor Lægeforen*, 2022 Vol. 142, DOI: 10.4045/tidsskr.22.0505.

**Introducing liability to transgender medicine might be the best way to turn the tide, in addition to state or federal legislation.**

diplomates on transgender medicine. And like transgender medicine, the lobotomy was considered effective and basically safe. Freeman lobotomized more than 200 patients by 1942. Through his charisma and manipulation of the media, Freeman portrayed the procedure positively to the public. It did not take long for Freeman to shift his view of the procedure as a last resort to a “treatment of choice.” Moreover, lobotomies were fairly simple to do, which made them a good source of revenue. That also added to its perception as a miracle cure. “The urgent hope for the dramatic and the magical in patients; the seductiveness of the facile and quick procedure for the psychiatrist; the exploitation of the easy and the profitable by the least competent therapist led . . . to a sickening abuse of this procedure,” wrote psychiatrist William Gaylin.<sup>72</sup>

By the 1950s, criticism had grown fierce. The Journal of the Norwegian Medical Association condemned the treatment in 1959 as “random, indiscriminate and lacking in neurophysiological and neuroanatomical insight.” Freeman’s final lobotomy was conducted in 1967. It ended in the death of the patient.

Lobotomies are technically still legal in the U.S. But few, if any, doctors today would perform one. Least of all, on a minor experiencing bodily distress. It would violate the “do no harm” principle and there’s too much liability involved.

Introducing that kind of liability to transgender medicine might be the best way to turn the tide, in addition to state or federal legislation. Detransitioners could hold the key.

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<sup>72</sup> Glenn Frankel, “Psychosurgery’s Effects Still Linger,” *The Washington Post*, April 5, 1980, <https://www.washingtonpost.com/archive/politics/1980/04/06/psychosurgerys-effects-still-linger/59614c3d-f2f4-4831-aeb2-85aa51833aab/>.

# APPENDIX

The following supplementary material contains insights into some of the key pieces of data in this report, including the costs of drugs and surgical procedures involved in the sex-trait modification process, the estimated current and future revenue growth of these drugs and procedures, and the most significant profiteers in this space. All of the information in the following analysis was collected and developed by Grand View Research in a project commissioned by American Principles Project. The methodology used by Grand View Research in calculating these figures is included at the end of the appendix.

# POPULATION SIZE AND GROWTH

In 2011, the Williams Institute estimated the transgender-identifying population to be around 700,000, or 0.3 percent of the adult population. Six years later, researchers at the institute put that number at over 1 million, including 150,000 transgender-identifying teens in the country, or roughly 0.7 percent of all teens, sug-

gesting that the transgender-identifying youth population has doubled in five years. Likewise, the 42,000 figure from Komodo of children and teens across the U.S who received a diagnosis of gender dysphoria in 2021 represented nearly triple the number in 2017.

FIGURE 1  
**U.S. TRANSGENDER-IDENTIFYING POPULATION, 2022**

AGE	PERCENT OF POPULATION	SIZE OF POPULATION
13 to 17	1.4%	300,100
18 to 24	1.3%	398,900
25 to 64	0.5%	766,500
65 and older	0.3%	171,700
13 and older	0.6%	1,637,200

FIGURE 2  
**"IDENTITY" OF ADULTS WHO IDENTIFY AS TRANSGENDER**





# COST ANALYSIS AND MARKET OUTLOOK OF SEX-TRAIT MODIFICATION SURGERIES

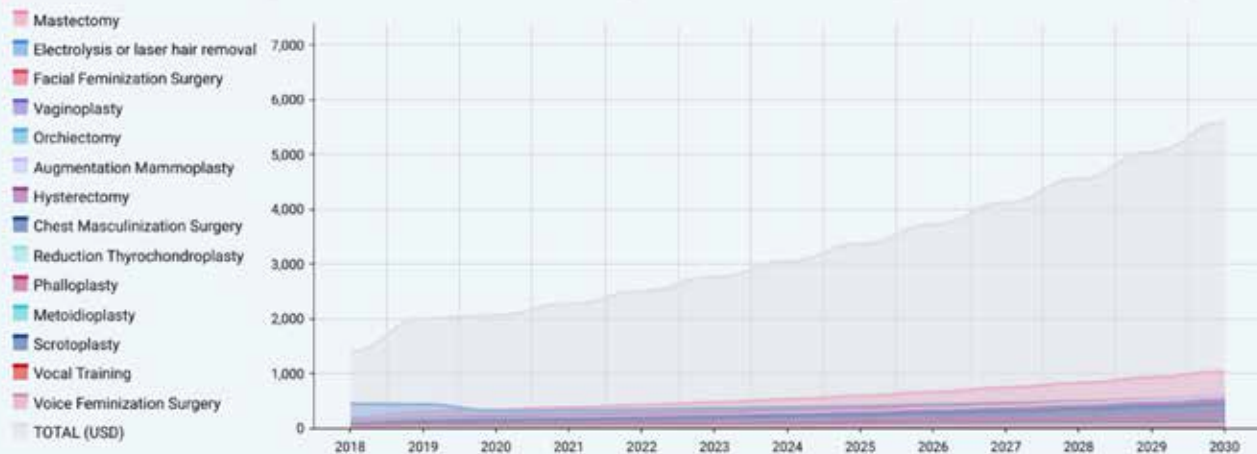
FIGURE 3

## SEX-TRAIT MODIFICATION SURGERY & HORMONE REVENUE, 2018-2030 (USD MILLION)



FIGURE 4

## U.S. SURGERY MARKET REVENUE ESTIMATES AND FORECAST, BY PROCEDURE, 2018-2030 (USD MILLION)



## SURGERY COST IMPACT OVERVIEW

The financial burden associated with sex-trait modification surgeries can often exceed \$140,000. The costs include charges for the operating room, recovery, anesthesia, medications, procedure-related expenses, laboratory fees, and medical expertise.

The financial impact of these surgeries varies depending on the transition direction. The process for males transitioning to appear female tends to be slightly more costly than for females transitioning to appear male. According to the

Philadelphia Center for Transgender Surgery, genital surgeries are approximately \$25,600 for male patients and around \$24,900 for female patients.

However, the financial implications extend beyond the direct costs of the surgeries. Some procedures are classified as cosmetic or aesthetic surgeries, which are typically not covered by insurance. Below is a list of procedure types and their associated cost range as well as their current market size and expected future outlook.

## PROCEDURE TYPES

### **Augmentation Mammoplasty**

Augmentation mammoplasty, also known as breast augmentation, is a surgery to increase the size of the breasts. The cost can vary depending on several factors including the type of implant used, where it takes place, and the experience of the surgeon. However, the average cost of breast augmentation surgery is approximately \$4,294, according to the American Society of Plastic Surgeons (ASPS). This figure does not include additional expenses such as anesthesia, operating room facilities, or other related expenses. The final cost can range from \$6,000 to \$12,000, depending on these factors.

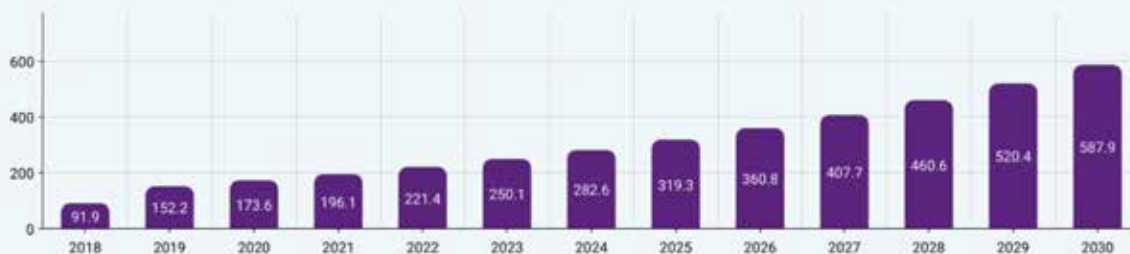
According to the ASPS, breast augmentation ranked among the top five cosmetic

surgical procedures performed in the U.S. in 2020, with 193,073 procedures conducted. Of these augmentations, 84 percent utilized silicone implants, while the remaining 16 percent employed saline implants. The Cleveland Clinic reported that around 300,000 breast augmentation surgeries are performed annually in the U.S.

The growth of the augmentation mammoplasty segment can be attributed in part to an increase in the availability and affordability of breast implants. Furthermore, the demand for augmentation mammoplasty among transgender-identifying patients is expected to grow further in the coming years.

FIGURE 5

### **AUGMENTATION MAMMOPLASTY MARKET, 2018-2030 (USD MILLION)**



### **Voice Feminization Surgery**

Voice feminization surgery (VFS) is a surgical procedure that alters the vocal cords to make the voice sound more typically feminine. The cost in the U.S. starts at around \$5,000 and can increase to \$9,000 or more. This does not include fees for speech therapy, overnight stays in the hospital, or any additional costs. VFS is

not typically covered by government or private medical insurance.

VFS is projected to experience substantial growth in the market, though it is only sought by about 1 percent of transgender-identifying men, according to the Cleveland Clinic.



### **Reduction Thyrochondroplasty**

Also known as a tracheal shave or Adam’s apple reduction, this surgical procedure reduces the size of the laryngeal prominence (Adam’s apple) to give the neck a more feminine appearance. The procedure involves making a small incision in the throat and shaving down the cartilage to

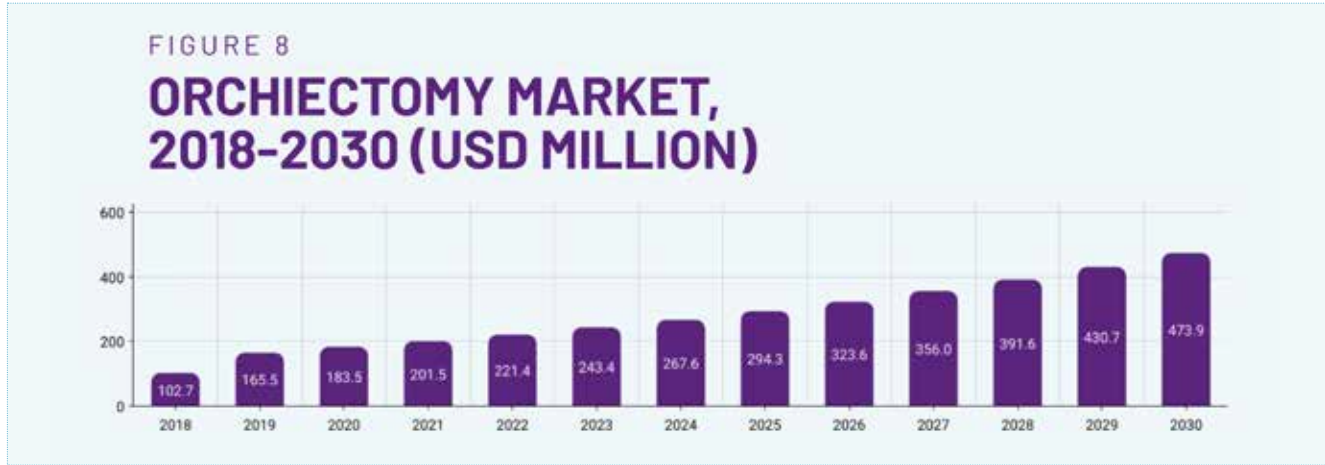
reduce the prominence of the Adam’s apple. The cost in the U.S. ranges from \$3,500 to \$7,000. This does not include any additional fees such as anesthesia, hospital stay, or follow-up care. Insurance coverage for this procedure varies widely.



## Orchiectomy

Orchiectomy is a surgical procedure in which one or both testicles are removed and can be a first step toward vaginoplasty. The cost of this procedure in the U.S. averages between \$5,000

and \$8,000. As more transgender-identifying individuals choose to undergo medical interventions, the demand for orchiectomy is expected to increase.

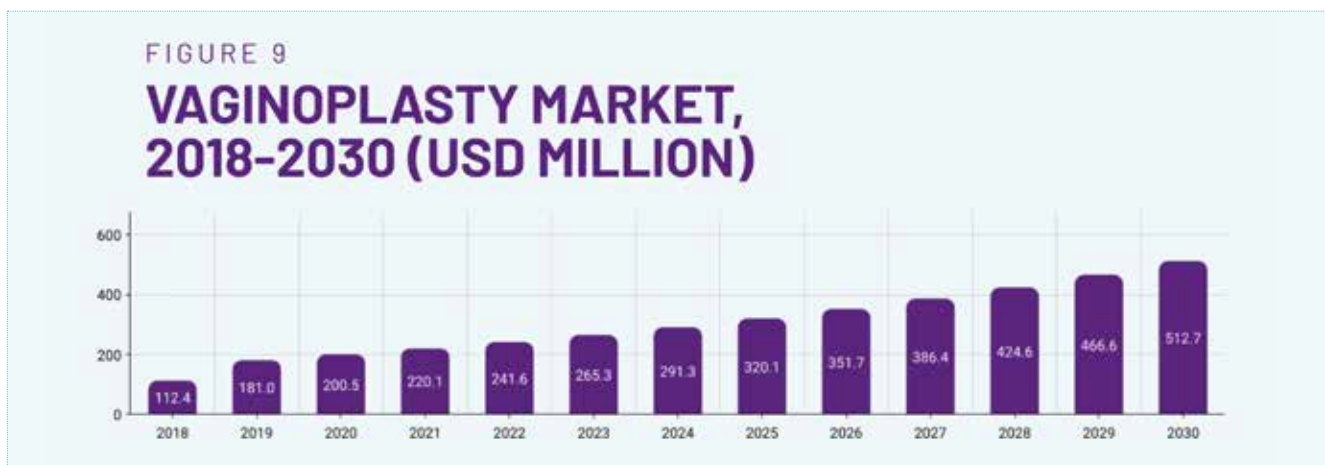


## Vaginoplasty

Vaginoplasty is a surgical procedure that constructs an artificial vagina or reconstructs and tightens an existing vagina. This procedure is often performed on transgender-identified males and involves removing the penis, testicles, and scrotum and rearranging tissue in the genital area to form an artificial vaginal canal and vulva, including the labia. It is typically performed as a one-stage procedure, although some individuals may choose to have an orchiectomy beforehand. The cost of a vaginoplasty in the U.S. can vary widely, ranging from \$10,000 to \$40,000.

This cost does not include any additional fees such as anesthesia, hospital stay, or follow-up care.

As transgender identification continues to grow, the demand for procedures such as vaginoplasty is expected to rise. According to the National Library of Medicine published report, approximately 12 percent of transgender-identified men in the U.S. have already undergone vaginoplasty surgery. Moreover, an additional 50 percent of transgender-identified men are considering surgical intervention.



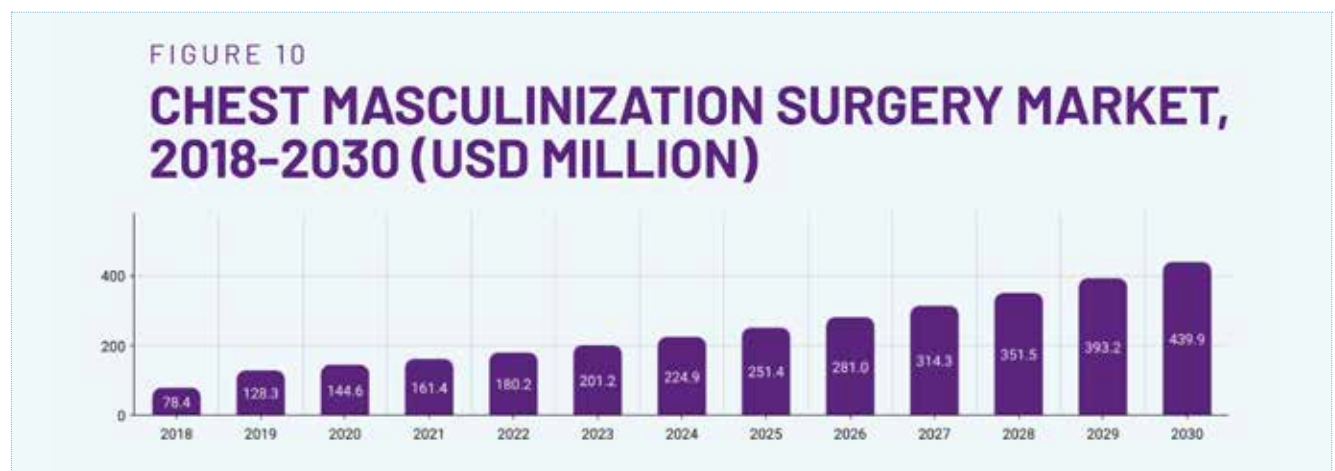


## Chest Masculinization Surgery

Chest masculinization surgery is a procedure often performed on transgender-identified women. It involves the removal of breast tissue and the reshaping of the chest to create a more masculine appearance. It may also involve adjusting the size and position of the nipples and areolas, or removing them altogether, based on the patient's preferences. The cost in the U.S. can range from \$6,000 to \$10,000. This price range can vary based on the specific techniques used, the surgeon's experience, and the geo-

graphic location of the procedure. This cost typically does not include additional fees such as anesthesia or hospital stay.

A study in *The American Journal of Surgery* has highlighted the growing demand for chest masculinization surgery among transgender-identified women. In addition, the U.S. Transgender Survey revealed that 61 percent of transgender-identified women expressed a desire for this surgery. These findings indicate likely continued growth in this market.



## Scrotoplasty

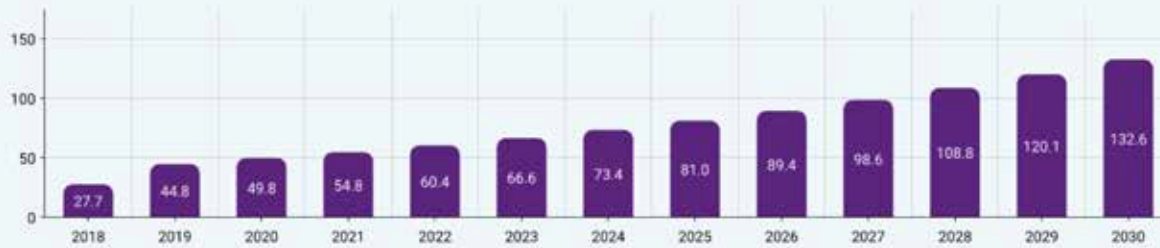
Scrotoplasty is a surgical procedure used to either repair or treat an existing scrotum or to create a new scrotum. It may be performed for infants with birth defects that affect scrotum anatomy or function but may also be performed in adults for cosmetic reasons, such as scrotum skin tightness; or for medical reasons, such as injury or congenital defects. Scrotoplasty can also be performed on transgender-identified women, where an artificial scrotum is created

from existing tissue. The overall complication rate of this surgery has shown to be roughly 20 percent of cases.

The cost of scrotoplasty in the U.S. can vary widely depending on the specific procedure and the individual's circumstances, but generally falls in the range of \$4,000 to \$6,000. The increasing demand for sex-trait modification surgeries is expected to drive the continued growth of this market.

FIGURE 11

## SCROTOPLASTY MARKET, 2018-2030 (USD MILLION)



### Hysterectomy

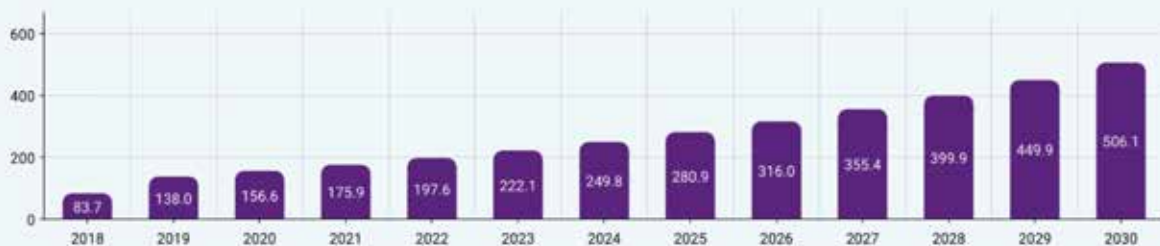
A hysterectomy is a surgical procedure that removes the uterus and, in some cases, the ovaries, fallopian tubes, and cervix. It is often performed to treat conditions such as uterine fibroids, endometriosis, or cancer. It may also be performed on transgender-identified women. The cost in the U.S. can vary significantly depending on the specific type of procedure, the method used, and the individual's health insurance coverage. On average, it can range from around \$5,300 to \$10,100. However,

these costs can be significantly higher in certain locations, with some estimates ranging between \$9,500 and \$22,500. It's important to note that these costs typically do not include additional fees such as anesthesia or hospital stay.

The number of hysterectomies performed for transgender-identified women is increasing each year, which is expected to drive growth in this segment, though currently, less than 1 percent of hysterectomies performed annually in the U.S. are for transgender-identified patients.

FIGURE 12

## HYSTERECTOMY MARKET, 2018-2030 (USD MILLION)

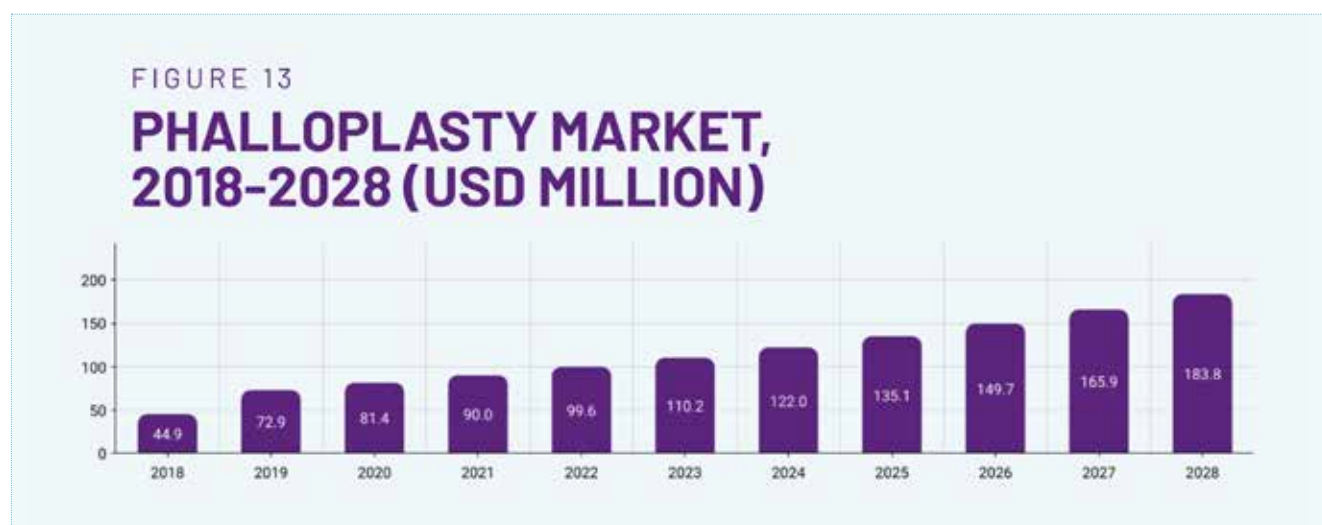


## Phalloplasty

Phalloplasty is a surgical procedure that constructs an artificial penis using skin from other parts of the body. This procedure is often performed on transgender-identified women. It involves creating a neo-phallus, forming a urethra, and, in some cases, creating a scrotum or other external male genital structures. The cost in the U.S. can vary widely, ranging from \$20,000 to \$50,000, or even as high as \$150,000. This cost does not include any additional fees such as anesthesia, hospital stay, or follow-up care.

Insurance coverage for this procedure varies widely.

The demand for phalloplasty is expected to increase as more transgender-identifying women seek surgical interventions. According to a 2019 article published by *Translational Andrology and Urology*, 3 percent of transgender-identified women have already undergone phalloplasty, while 19 percent express a desire for it in the future.



## Mastectomy

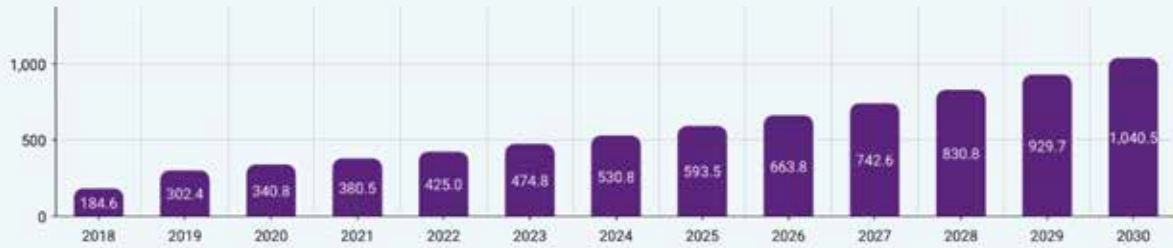
Mastectomy is a surgical procedure that involves the removal of one or both breasts, partially or completely. It is typically performed to treat or prevent breast cancer. In the context of sex-trait modification, a mastectomy may be performed on transgender-identified females. The cost of a mastectomy can vary widely, but it typically ranges from \$15,000 to \$50,000. This does not include any additional fees such as anesthesia, hospital stay, or follow-up care.

Insurance coverage for this procedure varies widely.

Research conducted by Komodo Health revealed that, between 2018-2021, at least 776 mastectomies were performed on individuals between the ages of 13 and 17 who had been diagnosed with gender dysphoria. The surge in demand for transition-related mastectomies among teenagers is a significant factor driving the growth of this segment.

FIGURE 14

## MASTECTOMY MARKET, 2018-2030 (USD MILLION)



### Metoidioplasty

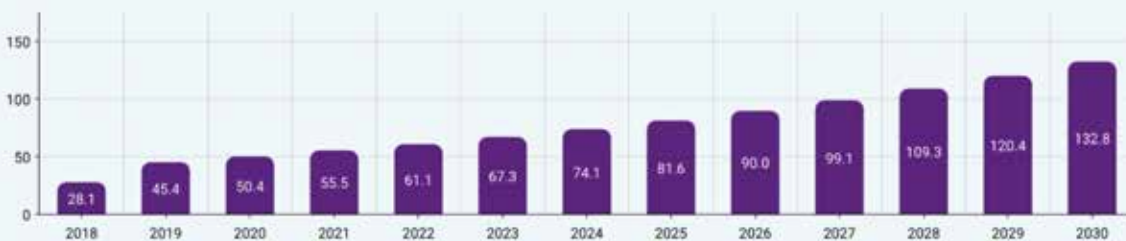
Metoidioplasty is a procedure performed on transgender-identifying women involving the creation of a neo-phallus from the clitoral tissue that has been enlarged through the use of testosterone. This procedure can also include the creation of a scrotum and urethral lengthening to allow for standing urination. The cost of metoidioplasty ranges from \$20,000 to \$30,000. This cost does not include additional fees such

as anesthesia, hospital stay, or follow-up care. Insurance coverage for this procedure varies widely.

Demand for this surgery has been increasing among transgender-identified individuals. Research has shown that out of 129 transgender-identified women who underwent genital surgery in 2021, 61 percent chose phalloplasty, and 25 percent opted for metoidioplasty.

FIGURE 15

## METOIDIOPLASTY MARKET, 2018-2030 (USD MILLION)



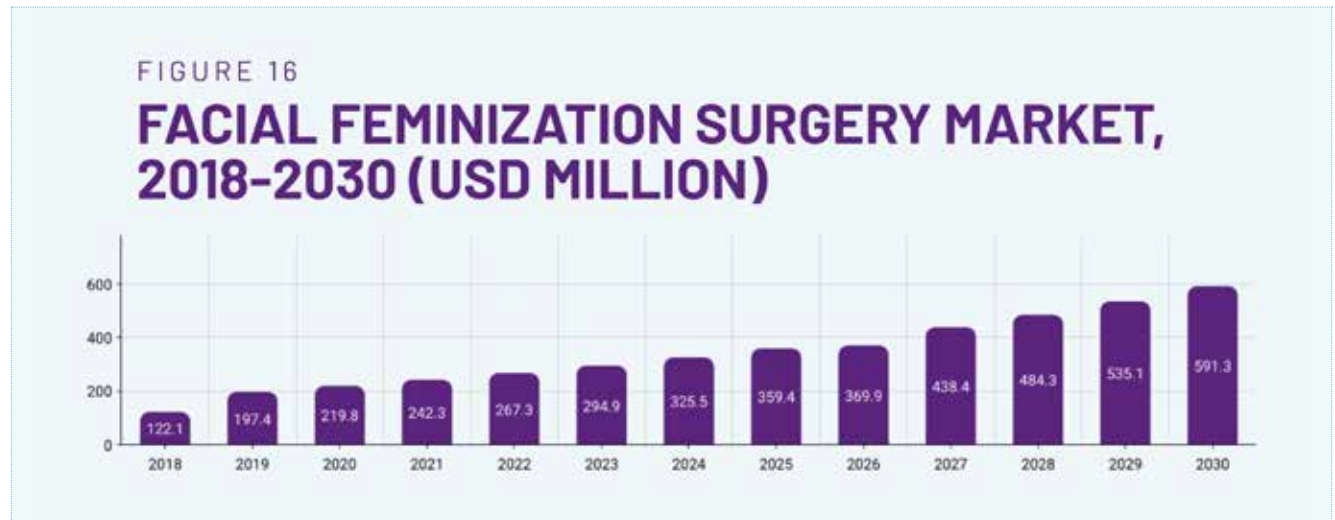
### Facial Feminization Surgeries

Facial feminization surgery (FFS) is a set of reconstructive surgical procedures on transgender-identified men that alter typically male facial features to bring them closer in shape and size

to typical female facial features. This may involve several different procedures, including brow lift, rhinoplasty, cheek implantation, lip augmentation, and others. The cost can vary greatly depending on

the specific procedures performed, the surgeon's experience, and the geographic location. The cost in the U.S. can range from \$20,000 to \$50,000 or more. This typically includes the surgeon's fee, hospital or surgical facility costs, anesthesia fees, prescriptions for medication, post-surgery garments, and medical tests.

According to the American Society of Plastic Surgeons, there was an increase in the number of transgender-identified men undergoing facial surgeries from 5,616 in 2019 to 6,368 in 2020, indicating a growing demand for this procedure.



### ***Electrolysis and Laser Hair Removal***

Electrolysis is a method of removing individual hairs from the face or body and may be performed on transgender-identified men as a form of sex-trait modification. During electrolysis, a tiny needle is inserted into the skin. The needle is then used to apply shortwave radio frequencies in hair follicles to stop new hair from growing. This damages the hair follicle to prevent hair growth and causes existing hairs to fall out. The cost of electrolysis treatments can vary greatly depending on the area of the body being treated and the number of sessions needed. On average, a single electrolysis treatment can cost between \$30 and \$200. However, multiple sessions are usually required to achieve the desired results, so the total cost can range from \$150 for smaller areas like the upper lip or chin to up to \$10,000 for larger areas like the legs or back.

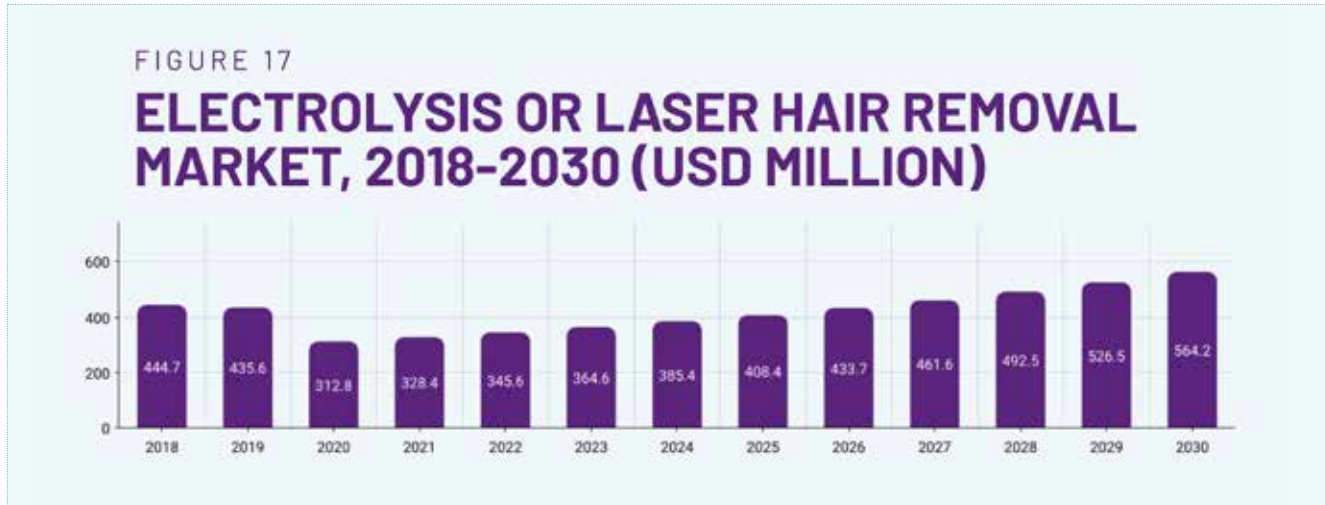
Laser hair removal is a permanent form of body hair removal that uses pulses of laser

light to destroy the hair follicle. This may also be utilized by transgender-identifying men for transition purposes. The cost of laser hair removal can vary greatly depending on the area of the body being treated and the number of sessions needed. On average, a single laser hair removal session can cost between \$100 and \$800. The average cost of laser hair removal with no other related expenses was \$582, according to the American Society of Plastic Surgeons. However, multiple sessions are usually required to achieve the desired results, so the total cost can add up. For example, a large area like the back or legs can be upwards of \$1,000 per treatment. Smaller areas of the body like the bikini line, underarms, and facial areas like chins, lips, and sideburns are less expensive. The bikini area can be anywhere from \$250 to \$350 per treatment, the lower face and chin can average about \$250 per treatment, and

underarm hair removal can range between \$175 to \$225 per treatment.

Research indicates that in 2020, 85 percent of transgender-identified men expressed a desire to remove facial or body hair, with laser hair

removal being the most commonly sought after facial procedure. The market is expected to expand further due to the increasing demand for these procedures.



### **Vocal Training**

Vocal therapy trains people to raise or lower their vocal pitch. The cost of vocal training can vary widely depending on the experience and qualifications of the coach, the length and frequency of the lessons, and whether the lessons are in-person or online. On average, voice lessons can cost

between \$50-\$200 per hour. Online lessons can range from \$25-45 for a half-hour lesson.

This market is expected to experience significant growth due to its increasingly being seen as a necessary step in the sex-trait modification process.



FIGURE 19

## COST OF PROCEDURES

PROCEDURE	COST (USD)
Augmentation Mammoplasty	\$6,000-12,000
Voice Feminization Surgery	\$5,000 -9,000
Reduction Thyrochondroplasty	\$3,500-7,000
Orchiectomy	\$5,000-8,000
Vaginoplasty	\$10,000-40,000
Chest Masculinization Surgery	\$6,000-10,000
Scrotoplasty	\$4,000- 6,000
Hysterectomy	\$9,500-22,500
Phalloplasty	\$20,000- \$150,000
Mastectomy	\$15,000-\$50,000
Metoidioplasty	\$20,000-30,000
Facial Feminization Surgery	\$20,000-50,000+
Electrolysis	\$50-200 (1 hour Session)
Laser hair removal	\$200-1,000
Vocal Training	\$50-\$200 per hour

### RISKS ASSOCIATED WITH SURGICAL PROCEDURES

Sex-trait modification surgery involves various complex procedures that come with specific risks and potential complications. Among these is post-surgery regret, which can lead to significant psychological distress.

Studies suggest that individuals who undergo sex-trait modification surgery may also have an increased risk of certain long-term health issues. For example, individuals who undergo breast augmentation may face an increased risk of developing breast cancer. The severity and probability of these risks vary depending on the specific procedure.

Individuals undergoing genital surgeries may experience a partial or complete loss of

sexual sensation or bladder functionality. Complications from genital surgeries are common. A study in California found that out of 869 vaginoplasty patients, 25 percent experienced a severe surgical complication warranting hospitalization. Among these patients, 44 percent needed additional surgery to address complications such as bleeding and bowel injuries.

As with any surgery, there are risks of complications such as bleeding, infection, and side effects of anesthesia. In some cases, these complications can be severe enough to require additional surgery or hospitalization.

The process of sex-trait modification, including surgeries, can be highly stressful and pose

significant risks to mental health. This includes an increased risk of depression, anxiety, and suicide. In fact, a study conducted in Sweden found that individuals who had undergone sex-trait modification surgery had a higher risk of

suicide attempts and psychiatric inpatient care compared to the general population. The same Swedish study also found that transgender-identified females had a higher risk for criminal convictions than their respective birth sex controls.

FIGURE 20

## RISKS ASSOCIATED WITH SURGICAL PROCEDURES

SURGERY	RISKS
Facial Feminization Surgery	Bleeding, infection, hematoma, poor healing of incisions, implant migration, hair loss, failure of the bone to heal along the incision line, prolonged swelling, and anesthesia risks
Male Chest Modification Surgery	Capsular contracture, loss of nipple sensation, implant leak, and anaplastic large cell lymphoma
Male Genital Modification Surgery	Stenosis of the neo-vagina, injury to the urinary tract, inadequate depth of the neo-vagina, nerve injury, abnormal connections between the urethra & the skin, and painful intercourse
Facial Masculinization Surgery	Failure of the bone to heal, implant migration, prolonged swelling, and hair loss along the incision line
Female Chest Modification Surgery	Loss of nipple sensation and loss of the nipple & areola
Female Genital Modification Surgery	Nerve injury, unsightly scars injury to the urinary tract, exposure of the prosthesis, abnormal connections between the skin & the urethra, and painful intercourse

FIGURE 21

## PROCEDURE TIMELINE BY SURGERY

SURGERY	EXPECTED SURGERY TIMELINE	EXPECTED RECOVERY TIMELINE
Chest Modification Surgeries (Chest Masculinization, Breast Augmentation)	1.5 to 4 hours	1 week
Hysterectomy	5 Days	6 to 8 weeks
Orchiectomy	1 hour	2 to 8 weeks
Phalloplasty	4 to 5 days	12 to 18 months
Vaginoplasty	2 to 5 hours (Primary care provided about a week after and then every 2-4 weeks for the first few months)	12 to 18 months
Facial Feminization (FFS)	6 to 12 hours	1 year
Scrotoplasty	1 to 2 hours	8 to 12 weeks
Metoidioplasty	2.5 to 5 hours	12 to 18 months
Mastectomies	1 to 2 hours	3 to 6 months
Electrolysis or laser hair removal	6 sessions separated by 6 weeks	3 months before surgery





# COST ANALYSIS AND MARKET OUTLOOK OF SEX-TRAIT MODIFICATION DRUGS

FIGURE 22

## U.S. SEX-TRAIT MODIFICATION HORMONE MARKET: DRUG TYPE SEGMENT DASHBOARD

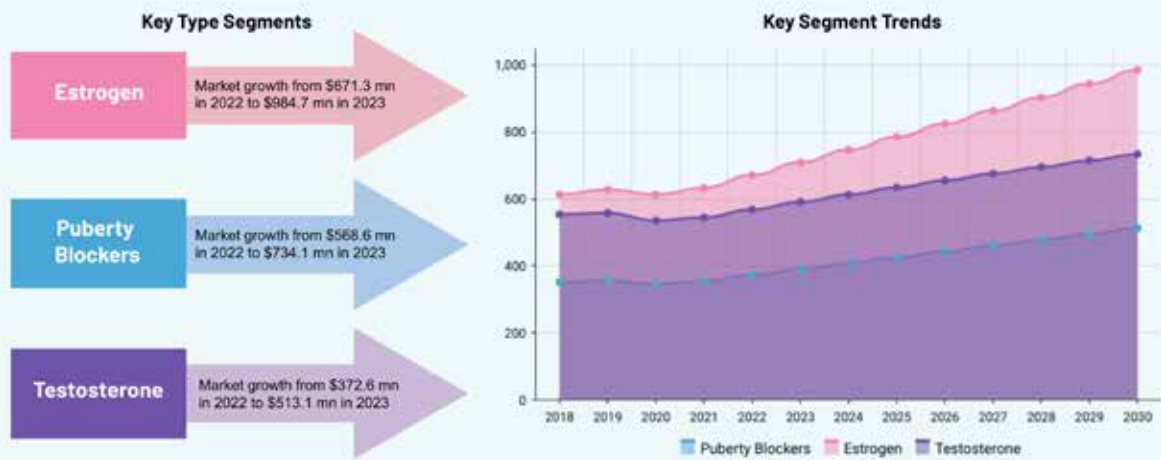


FIGURE 23

## U.S. SEX-TRAIT MODIFICATION HORMONE MARKET: DRUG TYPE MOVEMENT SHARE ANALYSIS, 2022 & 2030

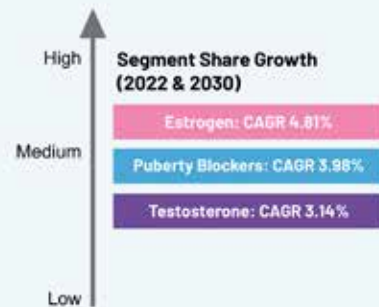
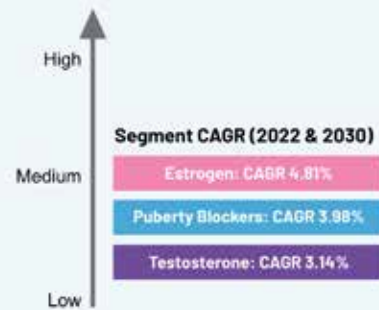
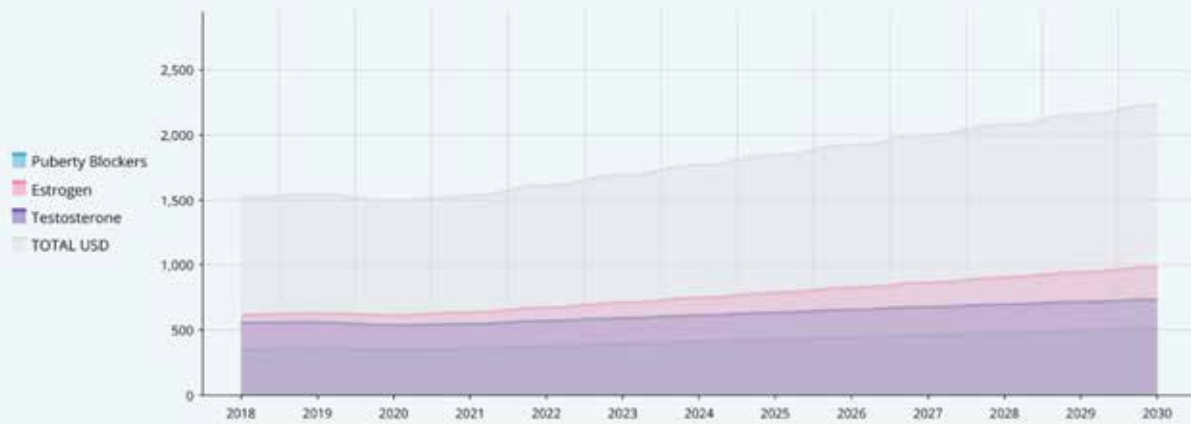


FIGURE 24

## U.S. PHARMACEUTICAL MARKET REVENUE ESTIMATES AND FORECAST, BY PROCEDURE, 2018-2030 (USD MILLION)



## PHARMACEUTICAL COST IMPACT OVERVIEW

The cumulative annual cost of hormone regimens for transgender-identified individuals can be substantial, encompassing the cost of medications such as estrogen, anti-androgens, and testosterone. A study using the formulary files of

the Centers for Medicare and Medicaid Services' prescription drug plan revealed that the out-of-pocket expenses associated with transition-related hormones ranged from \$84 to \$2,716 in 2010, rising to a range of \$72 to \$3,792 in 2018.

FIGURE 25

## TOTAL COST OF PROCEDURES (HORMONE THERAPY)

**\$500-\$25,000**

Total cumulative annual cost of sex-trait modification hormones per patient

## PHARMACEUTICAL PRODUCT TYPES

### GnRH Agonists (Puberty Blockers)

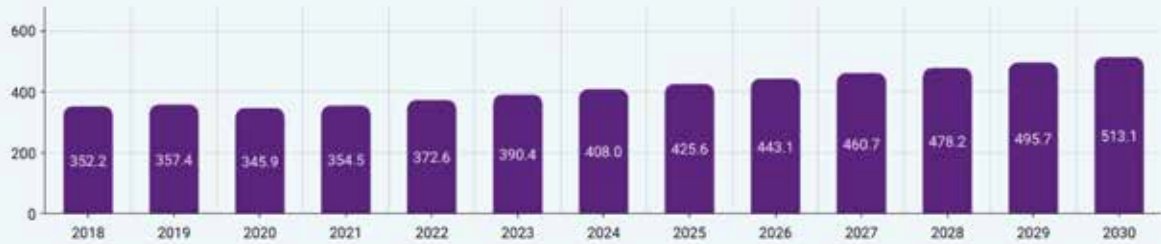
GnRH agonists are used to block the onset of puberty in transgender-identifying adolescents. The cost of GnRH agonists can vary widely depending on the specific medication used, the dosage, and the method of administration. The annual cost can range from a few thousand dollars to over \$25,000 per year. Lupron Depot, one of the most common GnRH agonists, can cost between \$1,000 and \$3,000 per month. The cost can also vary based on insurance cov-

erage and the pharmacy where the medication is purchased.

With the increasing number of adolescents identifying as transgender, GnRH agonists have emerged as the primary intervention for this cohort. Many physicians in the U.S. are prescribing these drugs to patients at the initial stages of puberty, starting as early as the age of eight. It is anticipated that the market for GnRH agonists will experience substantial growth in the coming years.

FIGURE 26

## PUBERTY BLOCKERS MARKET, 2018-2030 (USD MILLION)



### Estrogen

Estrogen is used as a sex-trait modification hormone for transgender-identified males. The administration of estrogen through various routes (such as oral, transdermal, intramuscular, sublingual, or subcutaneous) effectively lowers serum testosterone levels, elevates serum estradiol levels, and promotes the development of typical female secondary sex characteristics, including softer skin, breast growth, reduced muscle mass, and redistribution of body fat in a female pattern. Estrogen usage may also lead to testicular and penile atrophy.

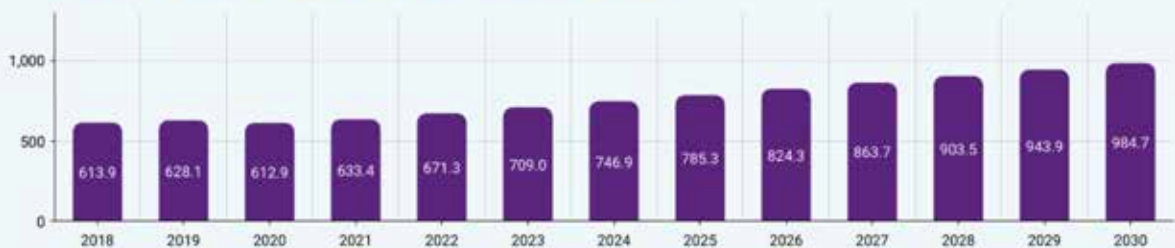
The annual cost of oral estrogen ranges from \$240 to \$480 per year, depending on the

dosage and specific type of estrogen used. Injectable estrogen, for instance, can range from \$1,800-\$2,400 annually. The cost can also vary based on insurance coverage and the pharmacy where the medication is purchased.

The market for transition-related hormone use is expected to experience growth due to the availability of a wide range of compatible products. Furthermore, strategic initiatives undertaken by key players in the U.S. are further driving the segment's growth. For instance, Pfizer recently announced in June 2023 that DUAVEE (conjugated estrogens) is back in stock in the U.S. after a voluntary recall.

FIGURE 27

## ESTROGEN MARKET, 2018-2030 (USD MILLION)



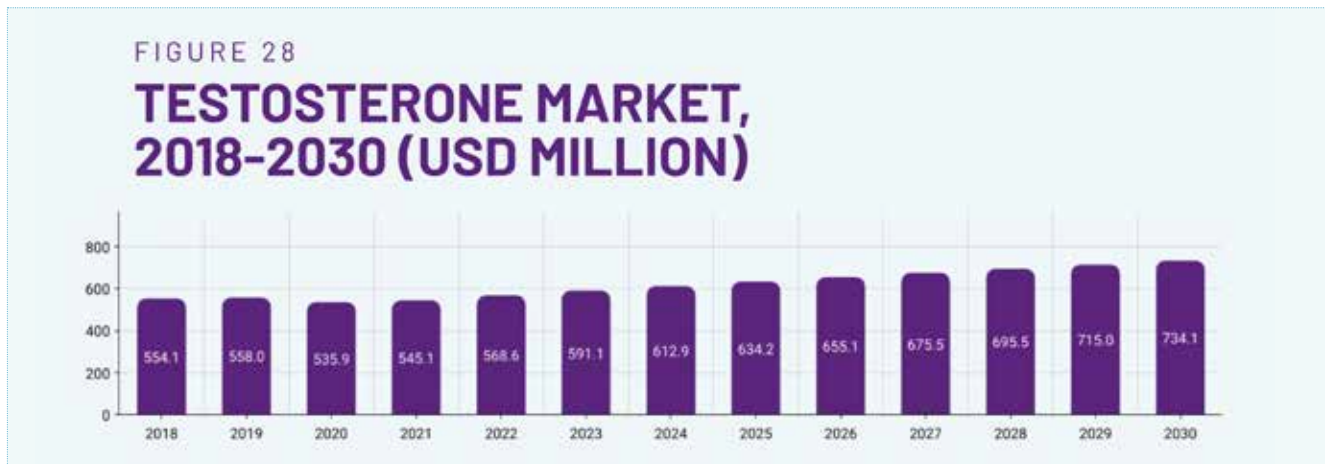
## Testosterone

Testosterone is used for sex-trait modification by transgender-identified females. It helps develop male secondary sexual characteristics and suppresses female secondary sexual characteristics.

Various testosterone formulations are available, with injected testosterone being the preferred standard choice. Self-injection generally starts with a dose of 125 mg titrated up to 250 mg to achieve male physiological concentrations. Cyclical effects may occur, such as expansive mood or aggression at the beginning of the cycle and irritability and fatigue at the end. Alternatively, testosterone undecanoate injections of 1000 mg every 10 to 12 weeks may be prescribed, which produce similar cyclical effects, however,

with less frequency. Owing to the risk of pulmonary micro embolism, these are not suitable for self-injection. While testosterone patches may eventually achieve similar masculinizing effects as injectable formulations, they take significantly longer to reach physiological concentrations.

The annual cost of testosterone can range from \$200 to \$1,200 per year, depending on the dosage, the specific type of the hormone used, and the method of administration (injections, patches, or gel). Testosterone patches can cost over \$3,600 annually, and testosterone gels can range from \$3,600 to \$4,200 annually. The cost can also vary based on insurance coverage and the pharmacy where the medication is purchased.



## Anti-Androgens

Anti-androgens are drugs that reduce the effects of androgens (male hormones) in the body. They are often used in combination with estrogen

in hormone therapy for transgender-identified males. Spironolactone, a commonly used anti-androgen, can cost around \$120-\$240 annually.

## Off-Label Use of Sex-Trait Modification Drugs

Off-label use of drugs refers to the use of a medication for a purpose that is not specifically approved by regulatory authorities, such as the U.S. Food and Drug Administration. Standard puberty blockers used for sex-trait modification, including Gonadotropin-Releasing Hormone (GnRH) analogs such as Supprelin (Histrelin), Zoladex (Goserelin), and Trelstar (triptorelin),

are prescribed off-label in the U.S. Frequently prescribed testosterone include Aveed (testosterone undecanoate) by Endo International as well as Depo-testosterone (testosterone cypionate) by Pfizer, Inc. For estrogen therapies, common options include estradiols. These can include Vivelle-Dot from Novartis and Estrogel from Ascend Therapeutics.

# LIFETIME COST TO PATIENT

The duration and specifics of the sex-trait modification process vary significantly from individual to individual, spanning from several months to several years. The length and nature of this process are a factor of the individual's age at the start of the process and the specific medical procedures they elect to pursue. For those who began this process during childhood, it is more extensive and physiologically impactful. This is primarily because the initial steps involve the use of hormones designed to suppress the onset of puberty. In the case of transgender-identified males, these hormones are initiated at the onset of puberty to prevent the natural development of masculine characteristics. Similarly, for transgender-identified females, these treatments aim to inhibit the natural development of feminine characteristics during adolescence.

Financially, the implications of sex-trait modification are staggering, encompassing costs related to hormone use, mental health services, surgical procedures, and post-operative care—including potential corrective surgeries. The cost of transition-related hormones can range from \$500 to nearly \$5,000 per year for individuals without health insurance. Over a lifetime, these costs can accumulate dramatically. For example, if an individual begins hormone use at age 18 and continues it for the rest of his or her life, the total cost could range from \$31,000 to well over \$300,000 (assuming a lifespan of 80 years) or even more.

The cost of sex-trait modification surgery can vary widely based on the specific procedures undertaken. For example, a breast augmentation or mastectomy can range from \$6,000 to

\$50,000, while a genital surgery (vaginoplasty or phalloplasty) can range from \$10,000 to \$150,000 or more. Additional procedures, such as facial feminization surgery or voice surgery, can add to these costs.

Mental health services, including therapy and counseling, are also often part of the process. The cost of these services can vary widely, but on average, therapy sessions can cost anywhere from \$75 to \$500 per session without insurance. There may also be additional costs associated with the sex-trait modification process, including costs for ongoing medical care, lab tests, and medications to manage potential side effects of hormones or surgery.

Yet, however significant the monetary impact of sex-trait modification may be for transgender-identifying individuals, the physical impact wrought by these radical procedures and potent pharmaceutical products cannot be understated. Hormones dramatically alter body composition, fat distribution, and secondary sexual characteristics to create the synthetic illusion of a biological remodeling. The use of hormones for sex-trait modification carries an additional risk of increased incidence of certain cancers. For example:

- *Breast Cancer:* Hormone use introduces considerations regarding breast cancer risk for transgender-identifying individuals. Transgender-identified men who undergo estrogen treatment as part of their transition may face an elevated risk of breast cancer compared to men as a whole. Similarly, transgender-identified women who receive testosterone may also have an

increased risk of breast cancer, particularly if they have not undergone a mastectomy.

- *Prostate Cancer:* Transgender-identified men still possess a prostate, and there is some evidence suggesting that long-term use of estrogen may increase the risk of prostate cancer.
- *Endometrial and Ovarian Cancer:* Among transgender-identified women who have not undergone surgical removal of the uterus and ovaries, the use of testosterone may heighten the risk of endometrial and ovarian cancer.
- *Liver Cancer:* There is emerging evidence suggesting a potential association between long-term use of oral estrogen and an increased risk of liver cancer.

Hormone use, specifically of estrogen, also significantly heightens the risk of life-threatening cardiovascular complications. The increased propensity for blood clot formation and cardiovascular events, such as heart attack and stroke, necessitates meticulous monitoring and proactive measures to mitigate these grave risks.

Sex-trait modification surgery carries both short-term and long-term risks and potential complications. These can vary greatly depending on the specific procedures involved, the individual's overall health, and the surgeon's skill and experience. Potential risks and complications associated with these surgeries include:

- *Surgical Complications:* Surgical procedures carry inherent risks, including the potential for complications such as excessive bleeding, infection, delayed wound healing, and anesthesia related issues. Additionally, individuals on estrogen face an elevated risk of blood clot formation, necessitating vigilant monitoring.

- *Nerve Damage:* Surgical interventions pose a genuine risk to nerve integrity, potentially resulting in sensory loss. This concern is particularly salient in surgeries involving the delicate neural pathways of the genital region.
- *Chronic Pain:* Post-surgical chronic pain can be debilitating, subjecting individuals to intense and excruciating discomfort. Complications such as severe nerve damage or poor wound healing can exacerbate the severity of this pain, imposing enduring challenges and impairing daily functioning.
- *Sexual Dysfunction:* Surgical interventions can have profound and lasting effects on sexual function, leading to persistent issues such as diminished sexual sensation or the distressing inability to achieve orgasm. These long-term consequences significantly impact individuals' quality of life and intimate relationships.
- *Mental Health Issues:* Surgery can trigger severe psychological distress, placing an enduring burden on individuals' mental well-being. Deep-rooted depression and crippling anxiety are observed outcomes, impacting daily functioning and overall quality of life. Feelings of overwhelming regret may haunt individuals post-surgery.
- *Need for Additional Surgeries:* Some individuals may face the daunting prospect of multiple subsequent surgeries to address complications or attain desired outcomes. Each successive surgery carries its own set of formidable risks and uncertainties, perpetuating a cycle of heightened vulnerability and prolonged recovery.

# COMPETITIVE LANDSCAPE: AN OVERVIEW

The U.S. sex-trait modification surgery and drug market is a complex and competitive arena with a multitude of players striving for market dominance. This intricate landscape is populated by a diverse mix of entities, ranging from large, established institutions to smaller, specialized clinics. The market is bifurcated between health systems and clinics that administer and perform the surgical procedures, and pharmaceutical companies that produce the requisite hormonal drugs.

The surgical market is notably fragmented, a characteristic attributable to the regional distribution of health systems. The entities contributing to the growth of this market are adopting a variety of strategies to fortify their market presence. These strategies include the provision of novel surgical offerings such as tracheal shave (chondrolaryngoplasty), male and female breast reduction, neo-vaginoplasty, and genital remodeling.

Moreover, these organizations are investing in particular areas of healthcare to earn accreditation on equity scoring standards and buoy their “LGBTQ+” bona fides. A case in point is

Cedars Sinai in Los Angeles, which in September 2020, achieved a perfect score of 100 on the Human Rights Campaign Foundation’s 2020 Healthcare Equality Index.

In the broader context of the transgender healthcare industry supply chain, other players such as medical device companies, including Allergan, which produces breast implants, and Boston Scientific, which manufactures penile prostheses, also form part of the competitive landscape. Additionally, NGOs and advocacy organizations such as the Transgender Legal Defense & Education Fund, GLAAD, and the ACLU, are facets of this supply chain as well. However, these entities are somewhat attenuated from the medical chain of custody—and liability profile—running through the industry and intersecting most directly and profoundly with the lives of transgender-identifying individuals. Therefore, this analysis has primarily focused on those entities that generate revenue from performing sex-trait modification procedures and from producing sex-trait modification pharmaceutical products.



# COMPETITIVE LANDSCAPE: SURGICAL

This analysis provides a snapshot of the sex-trait modification surgery market in 2022, but it is important to note that market dynamics can change rapidly due to factors such as changes in legislation, societal attitudes, and medical advancements. Market shares have been estimated based on an in-house estimation model

considering criteria such as market presence, service offering, locations, overall revenue, strategic initiatives, and state regulations. The sources of this data include investor presentations, annual reports, primary interviews, and internally sourced data points collected by Grand View Research, Inc., USA.

FIGURE 29

## SEX-TRAIT MODIFICATION SURGERY ESTIMATED MARKET & REVENUE SHARE, BY COMPANY, 2022 (USD MILLION)

SR. NO.	COMPANY	ESTIMATED MARKET SHARE (%), 2022	ESTIMATED SEX REASSIGNMENT SURGERY MARKET REVENUE, 2022 (USD MILLION)	OVERALL REVENUE, 2022 (USD MILLION)
1	Cedars Sinai	8.2%	\$205.70	\$6,592.30
2	Regents of the University of Michigan	6.1%	\$152.90	\$8,404.30
3	Mount Sinai Health System	5.5%	\$136.50	\$11,300.20
4	Kaiser Permanente	4.8%	\$120.20	\$95,408.10
5	Mayo Clinic (Transgender and Intersex Specialty Care Clinic)	4.6%	\$116.30	\$16,300.20
6	University of California, San Francisco Center of Excellence for Transgender Health	4.5%	\$112.50	\$6,931.70
7	CNY Cosmetic & Reconstructive Surgery	3.9%	\$97.50	NA
8	Cleveland Clinic	3.9%	\$97.60	\$11,570.60
9	Transgender Surgery Institute	3.8%	\$95.10	\$95.10
10	The Johns Hopkins University	3.8%	\$95.10	\$7,446.30
11	New York Presbyterian Hospital	3.0%	\$75.10	\$11,300.00
12	Others	51.3%	\$945.70	--



## COMPANY PROFILES

### KAISER PERMANENTE

- Kaiser Permanente, founded in 1945 in Oakland, is a California statewide managed care health system with 226,539 employees.
- Kaiser's offerings include healthcare marketed specifically to LGBTQ+-identifying individuals, such as hormones and sex-trait modification surgeries.
- Kaiser's East Bay Gender-Affirming Center has a specialized team providing sex-trait modification services.

#### KEY STATS:

- Overall Revenue 2021: \$93.10 billion
- Overall Revenue 2022: \$95.41 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 4.8 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$120.20 million

### MOUNT SINAI HEALTH SYSTEM

- The Mount Sinai Health System, founded 1852 in New York, is an integrated healthcare system comprising eight hospitals, ambulatory systems, and the Icahn School of Medicine at Mount Sinai. It has 13 independent joint venture centers, over 400 ambulatory centers, and 7,200 doctors.
- In 2016, it became the first organization in New York City to offer sex-trait modification surgery.
- In 2016, Mount Sinai launched The Centers for Transgender Medicine and Surgery (CTMS), which is the most comprehensive transgender-related healthcare program in the U.S.
- CTMS at Mount Sinai provides sex-trait modification surgeries, behavioral health support, hormone therapy, primary care, and other services for transgender-identifying patients.
- In 2019, the CTMS served 1,499 transgender-identifying patients, including providing hormones for 820 patients and major surgical procedures for 445 patients. Medical services include primary care, endocrinology, plastic surgery, gynecology, urology, otolaryngology, and mental health services.
- In May 2022, Mount Sinai received \$20 million from Royalty Pharma Plc for "health equity" research at its Institute for Health Equity Research.

#### KEY STATS:

- Overall Revenue 2021: \$9.06 billion
- Overall Revenue 2022: \$11.03 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 5.5 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$136.50 million
- Government Funding: \$770 million
- Private Donations: \$660 million

## UNIVERSITY OF CALIFORNIA, SAN FRANCISCO CENTER OF EXCELLENCE FOR TRANSGENDER HEALTH

- The University of California, San Francisco (UCSF) Center of Excellence for Transgender Health provides a host of services for transgender-identifying individuals.
- It offers hormones, primary care, and sex-trait modification surgeries such as vaginoplasty, phalloplasty, and chest reconstruction.
- As of June 2022, the UCSF Children's Hospital at the University of California San Francisco (UCSF) provides services through its transgender center to children as young as 3 years old. It also offers advocacy and legal assistance to transgender-identified children.

### KEY STATS:

- Overall Revenue 2021: \$5.57 billion
- Overall Revenue 2022: \$6.93 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 4.5 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$112.50 million
- Government Funding (NIH): \$823 million
- Private Donations: \$881 million

## REGENTS OF THE UNIVERSITY OF MICHIGAN HEALTH SYSTEM

- The Department of Surgery at the University of Michigan offers sex-trait modification procedures for both transgender-identified males and females, including hysterectomy, breast augmentation, and vaginectomy.
- In April 2019, Michigan announced the expansion of coverage for transgender-identifying members to include hormones, transition-related mastectomy, genital surgery, and counseling.

### KEY STATS:

- Overall Revenue 2021: \$9.06 billion
- Overall Revenue 2022: \$8.40 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 6.1 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$152.90 million

## CLEVELAND CLINIC

- Cleveland Clinic, founded in 1921, is a nonprofit multispecialty academic medical center that offers clinical, hospital care, research and education facilities.
- The company has 226 outpatient locations, including 20 patient-centered institutes and 21 hospitals with 6,496 beds.

### KEY STATS:

- Overall Revenue 2021: \$10.98 billion
- Overall Revenue 2022: \$11.57 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 3.9 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$97.60 million

## CEDARS-SINAI

- Founded in 1902 in Los Angeles, is a nonprofit academic healthcare organization with 40 locations, more than 3,258 physicians and nurses, and 1,500 active research projects. The organization comprises over 250 primary and specialty care locations throughout Los Angeles, 1.67 million outpatient visits, and 4,500 nurses on staff.
- In May 2023, Cedars established an LGBTQ+ Center that brings together a team of specialists in various fields, such as primary care, transgender surgery, reconstructive surgery, pediatrics, and anal cancer screening.
- In June 2018, Cedars expanded its services related to sex-trait modification procedures.

### KEY STATS:

- Overall Revenue 2021: \$4.29 billion
- Overall Revenue 2022: \$6.95 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 8.2 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$205.70 million

## CNY COSMETIC AND RECONSTRUCTIVE SURGERY

- CNY Cosmetic and Reconstructive Surgery, founded in 1998 in New York, is a medical practice company that offers multiple surgical procedures, including facial contouring, breast procedures and body contouring; reconstructive surgeries, including breast reduction and construction; scar revisions; skin cancer diagnosis; and sex-trait modification surgeries. The company offers transition-related mastectomy (breast removal) and breast augmentation.

### KEY STATS:

- Estimated Sex-Trait Modification Surgery Market Share, 2022: 3.9 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$97.50 million

## KAISER PERMANENTE

- Kaiser Permanente, founded in 1945 in Oakland, is a California statewide managed care health system with 226,539 employees.
- Kaiser's offerings include healthcare marketed specifically to LGBTQ+-identifying individuals, such as hormones and sex-trait modification surgeries.
- Kaiser's East Bay Gender-Affirming Center has a specialized team providing sex-trait modification services.

### KEY STATS:

- Overall Revenue 2021: \$93.10 billion
- Overall Revenue 2022: \$95.41 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 4.8 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$120.20 million

## MAYO CLINIC (TRANSGENDER AND INTERSEX SPECIALTY CARE CLINIC)

- Mayo Clinic's Transgender and Intersex Specialty Care Clinic provides specialized services for transgender-identifying and intersex individuals. The clinic provides medical and surgical interventions, as well as behavioral health services, fertility counseling and preservation, and voice and communication therapy.
- In November 2018, the Mayo Clinic began offering sex-trait modification surgery as part of the services provided by the Transgender and Intersex Specialty Care Clinic.

### KEY STATS:

- Overall Revenue 2021: \$15.70 billion
- Overall Revenue 2022: \$16.30 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 4.6 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$116.30 million

## NEW YORK PRESBYTERIAN HOSPITAL

- New York Presbyterian Hospital, founded in 1868, is an academic medical center that provides care for various health conditions.
- The hospital offers sex-trait modification surgery for transgender-identified patients, including breast augmentation, mastectomy, and vaginoplasty.

### KEY STATS:

- Overall Revenue 2021: \$9.90 billion
- Overall Revenue 2022: \$11.30 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 3 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$75.10 million
- Government Funding: \$44 million
- Private Donations: \$189 million

## TRANSGENDER SURGERY INSTITUTE

- The Transgender Surgery Institute of Southern California, founded in 2018, is a frontrunner in sex-trait modification surgery.
- The facility has a reputation for offering sex-trait modification surgery procedures for transgender-identified females, including metoidioplasty and secondary reconstruction, and procedures for transgender-identified males, including penile skin inversion, vaginoplasty, and secondary genital reconstruction.

### KEY STATS:

- Overall Revenue 2022: \$95.10 million
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 3.8 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$95.10 million

## THE JOHNS HOPKINS UNIVERSITY

- The Johns Hopkins University is a research university with a medical school that pioneered sex-trait modification surgery.
- The university opened the first transgender clinic in America in 1966. However, based on evidence suggesting that sex-trait modification surgery had no advantage for patients' social rehabilitation, the clinic was closed in 1979.
- In 2017, Johns Hopkins resumed offering sex-trait modification surgeries. It offers various services, including child and adolescent care, gynecology, transition-related facial surgery, fertility assistance, and obstetrics.
- In July 2022, Johns Hopkins expanded support for sex-trait modification, including updated insurance plans that cover a wide range of procedures.
- These include surgeries, hormones, mental health services, and fertility preservation.

### KEY STATS:

- Overall Revenue 2021: \$6.65 billion
- Overall Revenue 2022: \$7.44 billion
- Estimated Sex-Trait Modification Surgery Market Share, 2022: 3.8 percent
- Estimated Sex-Trait Modification Surgery Revenue, 2022: \$95.10 million

FIGURE 30

# SERVICE LINE BENCHMARKING WITH PROCEDURE COST RANGE

*The procedure names and descriptions in this table were derived by Grand View Research from the names and descriptions used by the service providers themselves.*

## 1. ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI

Trans-Feminine (Male-to-Female [MTF]) Surgeries	
Breast Augmentation: \$6k-\$12k	Breast augmentation involves surgeries that use breast implants or fat transfer to enhance breasts.
Facial Feminization Surgery: \$20k-\$50k+	Facial feminization surgeries include jaw & chin contouring, forehead and brow bone reshaping, hairline advancement, nose reshaping (rhinoplasty), and tracheal shaving.
Orchiectomy: \$5k-\$8k	Orchiectomy is the procedure of removing testes.
Vaginoplasty: \$5k-\$8k	Vaginoplasty includes creating a clitoris, vagina, labia minora, and labia majora with existing genital tissue.
Voice Feminization: \$5k-\$9k	Voice feminization involves shortening the length of vocal cords to make a higher pitch voice with the aid of Wendler glottoplasty.
Trans-masculine (Female to Male [FTM]) Surgeries	
Chest Masculinization: \$6k-\$10k	Chest masculinization surgery removes fat and mammary tissues to create a masculine chest.
Metoidioplasty: \$10k-\$40k	Metoidioplasty is a form of lower surgery that involves creating a penis from genital tissue. A full metoidioplasty involves vaginectomy and urethroplasty.
Phalloplasty: \$20k-\$150k+	Phalloplasty is a form of surgery that creates a penis from the flaps of skin and other tissues from a donor site of the body.
Hysterectomy: \$9.5k-\$22.5k	Hysterectomy is the surgical procedure involving removal of ovaries and uterus.

## 2. TRANSGENDER SURGERY INSTITUTE

MTF Gender Reassignment Surgery	
Penile Skin Inversion	Part of the head of the penis, with its blood and nerve supply, is moved to create a clitoris.
Vaginoplasty: \$10k-\$40k	This procedure combines penile inversion with creating an anastomosis (connection) to a portion of the rectosigmoid colon, along with skin grafts to construct the vaginal canal.
Secondary Genital Reconstruction	Sometimes secondary procedures are needed to enhance appearance or function.
FTM Gender Reassignment Surgery	
Metoidioplasty: \$10k-\$40k	Metoidioplasty is a form of lower surgery that involves creating a penis from genital tissue. A full metoidioplasty involves vaginectomy and urethroplasty.
Secondary Reconstruction	Sometimes secondary procedures are needed to obtain a better appearance and or function.
Facial and Cosmetic Surgery Process	
Brow Reshaping	This wide range of esthetic or facial surgeries can help enhance patients' transgender surgery results.
Facelifts	
Rhinoplasty	
Upper Blepharoplasty	
Laser Resurfacing	
Lip Enlargement	
Adam's Apple Surgery: \$3k-\$7k	
Facial Implants	
Liposuction	
Brazilian Butt Lift	
Chest Surgery	
Female to Male	This technique uses a periareolar incision & liposuction to remove the breast tissue behind the nipple and give the chest a more masculine, flatter appearance.
Male to Female	These techniques include breast implants, local flaps, or fat grafting.

### 3. CEDARS-SINAI

MTF genital surgeries	
Hysterectomy: \$9.5k-\$22.5k	A wide range of transfeminine surgeries
Primary Vaginoplasty and Revision Surgeries: \$5k-\$8k	
Neovaginal Cavity Creation, Neovaginal Cavity Revision, Zero-Depth Vaginoplasty: \$10k-\$40k	
Intestinal Vaginoplasty: \$5k-\$8k	
Chronic pain, infections	
FTM genital surgeries	
Metoidioplasty: \$10k-\$40k	A wide range of transmasculine surgeries
Radial Artery Forearm-Flap Phalloplasty: \$20k-\$150K	
Anterior Lateral Thigh-Flap Phalloplasty: \$20k-\$150k	
Supra-Pubic Flap Phalloplasty: \$20k-\$150k	
Vaginectomy	
Glansplasty	
Complex Scrotoplasty: \$4k-\$6k	
Testicular Prosthesis Placement	
Penile Prosthesis Placement, Replacement, and Revision	
Neourethral and Stricture Surgery	
Chronic Pain and Infections	
Facial Surgeries	
Forehead Contouring	This wide range of facial surgeries can help enhance patients' transgender surgery results.
Browlift	
Scalp Advancement	
Otoplasty	
Blepharoplasty	
Facelift and Neck Lift	

CONTINUES ►



## CEDARS-SINAI (CONTINUED)

Facial Surgeries (continued)	
Rhinoplasty	This wide range of facial surgeries can help enhance patients' transgender surgery results.
Lip Lift and Augmentation	
Mandible Contouring	
Chin Implant	
Tracheal Shave: \$3.5k-\$7k	
Plastic Surgery & Microsurgery	
Oculoplastic Surgery	This wide range of facial surgeries can help enhance patients' transgender surgery results.
Mastectomy: \$15k-\$50k	
Breast Augmentation: \$6k-\$12k	
Feminizing Hand Surgery	
Liposuction and Filling	
Scar Revision	
Mon Pubis Revision	
Neophallus "Lift" (Suspension) Surgery	
Gynecologic Surgeries and Services	
Hysterectomy and Oophorectomy: \$9.5k-\$22.5k & \$5k-\$8k	This wide range of facial surgeries can help enhance patients' transgender surgery results.
Reproductive Endocrinology	
Colorectal Reconstructive Surgery	
The surgery for the creation of a functional neovagina.	The surgery for the creation of a functional neovagina.
Urology	
Genital Gender-Affirming Surgeries	It comprises the reconstruction of genitals, which is identical to identified sex of the patient.

## 4. MOEIN SURGICAL ARTS

Male-to-Female Gender Reassignment Surgery (GRS) or sex reassignment surgery	It modifies the function & form of sexual organs, such as the penis and testicles, to reconstruct them into a functional vagina.
Hair Removal	It offers temporary laser hair removal and permanent hair removal with electrolysis to MTF patients.
Breast Augmentation: \$6k-\$12k	It involves breast enlargement with the aid of implants.
Tracheal Shave: \$3k-\$7k	It provides chondrolaryngoplasty to reduce Adam's apple prominence for feminine voice in MTF patients.
Facial Feminization: \$20k-\$50K+	It offers procedures for enhancement of the cheeks, chin, jawline, lips, eyelids, lips, nose, or forehead.

## 5. BOSTON MEDICAL CENTER

Breast Augmentation: \$6k-\$12k	The breasts represent a major aspect of a woman's allure and figure. With breast augmentation, the patient can embrace the feminine side.
Chest Reconstruction	These are surgical procedures to masculinize the chest by removing breast tissue or altering the nipples and areolae.
Neo-Vaginoplasty: \$10k-\$40k	In neo-vaginoplasty surgery, skin of the penis is used to make the new vagina.
Genital Remodeling	These surgical techniques are used in a full neo-vaginoplasty without constructing a vaginal cavity.
Orchiectomy: \$5k-\$8k	It is a surgical procedure to remove both testicles.
Hysterectomy: \$9.5k-\$22.5k	It is a surgical procedure to remove cervix and uterus.
<b>Plastic Surgery</b>	
Male Breast Reduction (Gynecomastia)	It is a surgical correction of over-developed or enlarged breasts in men
Breast Reduction Surgery (Reduction Mammoplasty)	Removes excess breast fat and glandular tissue
Breast Lift (Mastopexy)	This procedure removes extra skin and tightens the nearby tissue to reshape and support the newly contoured breast.

## 6. CLEVELAND CLINIC

Male Gender-Affirming Surgeries	
Masculinizing/Defeminizing Chest Reconstructive Surgery (Mastectomy)	It offers nipple grafting and masculinizing chest contouring.
Hysterectomy: \$9.5k-\$22.5k	It involves removal of cervix, uterus, fallopian tubes, and ovaries.
Female Gender-Affirming Procedures	
Breast Augmentation: \$6k-\$12k	It involves breast enlargement with the aid of implants.
Orchiectomy: \$5k-\$8k	It involves removal of testes, which alleviates genital dysphoria and removes androgen suppression needs
Vaginoplasty: \$10k-\$40k	It involves formation of vulva without or with vaginal canal.
Phalloplasty/Metoidioplasty: \$20k-\$150k+/\$20k-\$30k	Metoidioplasty is a form of lower surgery that involves creating a penis from genital tissue. A full metoidioplasty involves vaginectomy and urethroplasty.
Tracheal Shaving Surgery (Chondrolaryngoplasty)	It involves reduction of thyroid cartilage to decrease the Adam's apple size.
Facial Feminization Procedures	It involves various procedures to provide feminine facial features.

## 7. CNY COSMETIC & RECONSTRUCTIVE SURGERY

Female-to-Male Mastectomy (Breast Removal): \$15k-\$50k	The primary goal of subcutaneous mastectomy is to achieve a visually appealing appearance of the male chest by removing all glandular tissue and minimizing scars on the chest wall.
Male-to-Female Breast Augmentation (Breast Reconstruction): \$6k-\$12k	Transgender breast augmentation is a cosmetic surgical procedure that enhances the chest size and/or shapes of transfeminine patients using

## 8. PLASTIC SURGERY GROUP ROCHESTER

Breast Reconstruction	Breast reconstruction is a surgical procedure performed to either replace breasts that have been surgically removed in a mastectomy or to restore the shape and appearance of breasts that have been altered or deformed due to a lumpectomy.
Breast Reduction	The main goal of breast reduction is to reduce the size of the breasts.
Gender Reassignment Surgery	It is a surgical procedure that aims to modify a transgender individual's physical appearance and functional characteristics to align with their identified gender, as perceived and accepted by society.

## 9. REGENTS OF THE UNIVERSITY OF MICHIGAN

Male to Female	
Breast Augmentation: \$6k-\$12k	Surgical procedures for male-to-female transformation, enhancing feminine features and achieving desired aesthetic outcomes.
Facial Feminization: \$20k-\$50k+	
Male-to-Female genital sex reassignment	
Female to Male	
Hysterectomy: \$9.5k-\$22.5k	Surgical procedures for female-to-male transformation and gender-affirming changes.
oophorectomy	
vaginectomy	
Chest Reconstruction	

## 10. THE JOHNS HOPKINS UNIVERSITY

Female-to-male genital sex reassignment	It is a phalloplasty surgery for female-to-male sex reassignment, utilizing the radial forearm flap technique to create desired anatomical changes.
Chest Masculinization, feminization	
Breast Augmentation: \$6k-\$12k	Provides a comprehensive selection of gender-affirming surgeries to support individuals undergoing male-to-female or female-to-male transitions.
Facial Feminization (FFS): \$20k-\$50K+	
Hysterectomy, Ovariectomy, Salpingectomy: \$9.5k-\$22.5k	
Orchiectomy: \$5k-\$8k	
Phalloplasty: \$20k-\$150k+	
Vaginoplasty: \$5k-\$8k	
Voice Therapy	

## 11. KAISER PERMANENTE

Orchiectomy: \$5k-\$8k	Feminizing genital surgery options, including orchiectomy, vulvoplasty, and vaginoplasty, performed under general anesthesia for those seeking transformative procedures.
Vulvoplasty	
Vaginoplasty: \$5k-\$8k	
Metoidioplasty: \$10k-\$40k	Masculinizing genital surgery options, including metoidioplasty and phalloplasty, performed under general anesthesia for individuals seeking transformative procedures to align with their gender identity.
Phalloplasty: \$20k-\$150k+	
Facial Feminization Surgery (FFS): \$20k-\$50K+	It involves craniofacial procedures to enhance gender-specific appearances, creating a more feminine or masculine aesthetic.
Facial Masculinization Surgery (FMS)	
Gynecologic Services	Comprehensive gynecologic services offering hysterectomy, salpingo-oophorectomy (removal of uterus, ovaries, fallopian tubes), and minimally invasive surgery options for transgender and nonbinary individuals.

## 12. UNIVERSITY OF CALIFORNIA, SAN FRANCISCO CENTER OF EXCELLENCE FOR TRANSGENDER HEALTH

Feminizing mammoplasty (breast augmentation)	Offers gender-affirming chest surgeries. This surgical procedure is designed to enhance the size and shape of the breasts of individuals.
Masculinizing chest reconstruction/mastectomy	
Facial feminization surgery: \$20k-\$50K+	FFS is a comprehensive set of surgical procedures designed to enhance gender-specific appearances.
Hysterectomy/oophorectomy: \$9.5k-\$22.5k	Offers gynecologic surgical procedures, including Hysterectomy and Oophorectomy. Hysterectomy is a surgical procedure that involves the removal of the uterus. Oophorectomy procedure involves the removal of one or both ovaries.
Orchiectomy: \$5k-\$8k	Offers the surgical procedure known as orchiectomy, which involves removing one or both testicles.
Vaginoplasty: \$5k-\$8k	Offers a comprehensive range of gender-affirming surgical procedures designed to support individuals seeking to align their physical appearance with their gender identity.
Vulvoplasty	
Scrotoplasty	
Metoidioplasty: \$10k-\$40k	

### 13. NEW YORK PRESBYTERIAN HOSPITAL

Gender-affirming mastectomy or breast augmentation	It can help develop the chest shape with personalized surgical options for individuals seeking gender affirmation.
Tracheal shave	It offers tracheal shave, a surgical procedure that removes cartilage from the front larynx, reducing the visibility of the Adam’s apple and achieving a more feminine look.
Vaginoplasty: \$5k-\$8k	Vaginoplasty can be used to construct a vagina out of penile tissue.
Penile construction: \$20k-\$150k	It can help construct a penis using vaginal tissue or tissue from another body area.
Revision surgery	It can help to correct past gender-reconstruction surgeries that had unsatisfying results.

### 14. MAYO CLINIC (TRANSGENDER AND INTERSEX SPECIALTY CARE CLINIC)

Feminizing surgical procedures	It offers a wide range of procedure includes, breast augmentation, Facial feminization, tracheal shave, body-contouring procedures, orchiectomy, vaginoplasty and labioplasty, and robot-assisted peritoneal flap vaginoplasty.
Masculinizing surgical procedures	It offers a wide range of masculinizing surgical procedures, including mastectomy with chest masculinization, Body-contouring procedures, hysterectomy, and oophorectomy metoidioplasty.



# COMPETITIVE LANDSCAPE: PHARMACEUTICAL

The following market shares have been estimated considering a range of criteria, including market presence, service offering, locations, overall revenue, strategic initiatives, and state regula-

tions. This analysis is based on information from investor presentations, annual reports, and internally sourced data points collected by Grand View Research.

FIGURE 31

## U.S. HORMONE THERAPY PRODUCT MARKET & REVENUE SHARE, BY COMPANY, 2022 (USD MILLION)

COMPANY	OVERALL ESTIMATED MARKET SHARE (%)	THERAPY TYPE			OVERALL REVENUE (USD MILLIONS)
		ESTROGEN	TESTOSTERONE	PUBERTY BLOCKERS	
Pfizer Inc.	4.6%	\$48.21	\$18.54	\$7.42	\$100,330.00
AbbVie Inc.	3.2%	\$30.96	\$12.90	\$7.74	\$58,054.00
Endo International plc	2.9%	\$32.73	--	\$14.03	\$2,320.00
Novartis AG	2.1%	\$33.86	--	--	\$50,545.00
Lilly (Eli Lilly)	1.8%	\$16.93	\$11.29	--	\$28,541.40

## COMPANY PROFILES

### PFIZER

- Pfizer is engaged in the discovery, development, and production of pharmaceutical products. It has a diverse portfolio of vaccines and medicines. With 42 manufacturing facilities, the company operates in over 125 countries.
- Pfizer is one of the leading players in the market for sex-trait modification pharmaceuticals. It offers a wide range of hormone products across 181 locations worldwide, including puberty blockers, estrogen, and testosterone. In particular, it has strong brand recognition in the estrogen and progesterone markets. Over the years, Pfizer has undertaken numerous initiatives to enhance its hormone offerings, resulting in a significant market share.

#### KEY STATS:

- Overall Revenue 2021: \$10.98 billion
- Overall Revenue 2022: \$100.33 billion
- Estimated Hormone Market Share, 2022: 4.6 percent
- Estimated Estrogen Revenue, 2022: \$48.21 million
- Estimated Testosterone Revenue, 2022: \$18.54 million
- Estimated Puberty Blocker Revenue, 2022: \$7.42 million

### ABBVIE INC.

- AbbVie is a biopharmaceutical company that focuses on various therapeutic areas, such as immunology, oncology, virology, neuroscience, and general medicine. It was established as a spin-off from Abbott.
- AbbVie is a formidable player in the hormone market, offering puberty blockers, estrogen, and testosterone.

#### KEY STATS:

- Overall Revenue 2021: \$56.19 billion
- Overall Revenue 2022: \$58.04 billion
- Estimated Hormone Market Share, 2022: 3.2 percent
- Estimated Estrogen Revenue, 2022: \$30.96 million
- Estimated Testosterone Revenue, 2022: \$12.90 million
- Estimated Puberty Blocker Revenue, 2022: \$7.74 million



## ENDO INTERNATIONAL PLC

- Endo International plc is a global specialty pharmaceutical company focused on developing, manufacturing, and marketing branded and generic pharmaceutical products in various therapeutic areas.
- Endo's revenue in the hormone market comes from estrogen and puberty blockers, but not from testosterone.

### KEY STATS:

- Overall Revenue 2021: \$2.99 billion
- Overall Revenue 2022: \$2.32 billion
- Estimated Hormone Market Share, 2022: 2.9%
- Estimated Estrogen Revenue, 2022: \$32.73 million

## NOVARTIS AG

- Novartis operates through three business segments: Innovative medicine, Corporate, and Sandoz. The innovative medicine segment is further bifurcated into pharmaceuticals and oncology. The company has a presence in over 140 countries globally.
- The company's sole revenue in the hormone market comes from estrogen, with no reported revenue from testosterone or puberty blockers.

### KEY STATS:

- Overall Revenue 2021: \$51.62 billion
- Overall Revenue 2022: \$50.54 billion
- Estimated Hormone Market Share, 2022: 2.1 percent
- Estimated Estrogen Revenue, 2022: \$33.86 million

## LILLY (ELI LILLY)

- Lilly is a pharmaceutical company involved in discovering, developing, and delivering pharmaceutical products. The company focuses on several therapeutic areas, including diabetes, oncology, immunology, neurology, and endocrinology.
- It operates globally and has a significant presence in various countries, such as the U.S., Europe, and Japan.
- Their revenue in the hormone market comes from estrogen and testosterone, but not from puberty blockers.

### KEY STATS:

- Overall Revenue 2021: \$28.31 billion
- Overall Revenue 2022: \$28.54 billion
- Estimated Hormone Market Share, 2022: 1.8 percent
- Estimated Estrogen Revenue, 2022: \$16.93 million
- Estimated Testosterone Revenue, 2022: \$11.29 million

FIGURE 32

# PRODUCT BENCHMARKING BY COMPANY WITH DESCRIPTION

## 1. VIATRIS INC.

Estrogen	
Estradiol Transdermal System	Estradiol transdermal system is an estrogen patch used to deliver estrogen through the skin directly into the bloodstream. It is also used in individuals pursuing sex-trait modification.
Estradiol Vaginal Cream	This product is the first generic version of Estrace Cream used in topical hormone replacement therapy, which is used to replace the hormone estradiol.
Elestrin - Estradiol Gel	This product helps in increasing the estrogen hormone levels in individuals pursuing sex-trait modification.
Progesterone	
Progesterone Only Pills	The company is involved in the commercialization of formulations of Lynestrenol, Norethindrone, Norgestrel, Desogestrel, and Levonorgestrel. These are combined with other estradiol-containing medications for individuals who have not undergone hysterectomy.

## 2. ABBVIE INC.

Testosterone	
AndroGel	AndroGel is a testosterone gel-based product that is used to increase the testosterone level in an individual.
Estrogen	
ALORA	ALORA is an estrogen transdermal system used for increasing the level of estrogen in individuals pursuing sex-trait modification.
ESTRACE	ESTRACE is an estrogen used for increasing the level of estrogen in individuals pursuing sex-trait modification.
Oriahnn	It is indicated for individuals pursuing sex-trait modification.
Progesterone	
CRINONE	CRINONE is a progesterone gel used in individuals pursuing sex-trait modification. It is also used in women with secondary amenorrhea by increasing the level of progesterone.
Prometrium (progesterone)	This product contains progesterone and is used to restore progesterone levels in individuals pursuing sex-trait modification.

### 3. ASCEND THERAPEUTICS US, LLC.

Estrogen	
EstroGel	EstroGel is an FDA-approved non-patch transdermal estrogen therapy gel used for increasing the level of estrogen in individuals pursuing sex-trait modification.

### 4. PFIZER INC.

Estrogen	
Duavee	The formulation contains conjugated estrogens and bazedoxifene. It is used to supplement and induce depleted estrogen levels.
Viviant	This is a synthetic drug used for sex-trait modification. It is a Selective Estrogen Receptor Modulator (SERM) formulated by Pfizer and Ligand Pharmaceuticals, Inc.
Premarin	The drug contains estrogen that is used for increasing the level of estrogen in individuals pursuing sex-trait modification. It is available in the form of tablets, creams, and injections.
Progestin	
PREMPRO/ PREMPHASE	It is a product in tablet dosage form, containing Conjugated Estrogens (CE) and medroxyprogesterone acetate. It is used to increase the level of progesterone to enhance androgenic effects.
Testosterone	
Depo Testosterone	This product is used for the treatment of impotence, delayed puberty in males, and hormonal imbalances.
Orgovyx	Orgovyx is an orally administered treatment that functions by inhibiting the production of luteinizing hormone and follicle-stimulating hormone in the pituitary gland. This mechanism helps in decreasing the testosterone production in the testicles.

### 5. LILLY (ELI LILLY)

Testosterone	
Axiron	The formulation is a topical solution of testosterone prescribed to adult males suffering from low or no production of testosterone. It includes 30 ml of the drug per 1.5 mL solution.
Estrogen	
Evista	Evista contains raloxifene hydrochloride, which is a SERM and is used in sex-trait modification.

## 6. NOVARTIS AG

Estrogen	
VIVELLE-DOT	VIVELLE-DOT is an estrogen product used to increase the level of estrogen, occurring in naturally or surgically induced estrogen deficiency states and for sex reassignment.
ESTRADOT	ESTRADOT is a Generic version of VIVELLE-DOT, an estrogen product used in increasing the level of estrogen in individuals pursuing sex-trait modification.

## 7. ENDO INTERNATIONAL PLC

Testosterone	
AVEED	AVEED contains testosterone, a controlled substance (CIII) used for treating adult males who have low or no testosterone by increasing the level of testosterone.
TESTOPEL	TESTOPEL is a testosterone pellet approved for testosterone replacement therapy in adult males.
TESTIM	TESTIM is a testosterone gel approved for testosterone replacement therapy in adult males.
FORTESTA	FORTESTA is testosterone gel that is approved for testosterone replacement therapy in adult males.
Gonadotropin Releasing Hormone (GnRH)	
SUPPRELIN LA	Supprelin LA (histrelin acetate) is a medication that can be implanted and is utilized to hinder the ongoing progression of puberty. It is employed in situations such as precocious puberty or gender dysphoria.

# METHODOLOGY

Market sizing and segmentation; population size and growth outlook; and historical, baseline, and forecast revenue estimates were provided in consultation with Grand View Research, Inc. USA.

## ESTIMATES AND FORECAST TIMELINE

The analysis covers market sales forecast revenues of the U.S. sex-reassignment surgery and hormone therapy market for the following years:

- Historical years: 2018 -2021
- Base year: 2022
- Projected years: 2023-2030

## RESEARCH ASSUMPTIONS

- This analysis provides market value for the base year 2022 and a yearly forecast until 2030 in terms of revenue (USD Million). The market for each segment has been provided for the above-mentioned forecast period.
- The key industry dynamics, major technological trends, transgender- and binary-identifying population, and procedure markets are evaluated to understand their impacts on the demand for the forecast period. The growth rates were estimated using correlation, regression, and time-series analysis.
- A bottom-up approach was used for market sizing, analyzing key markets, dynamics, and trends for procedures.
- The average cost and number of surgical procedures have been considered to estimate and forecast the market. All market estimates and forecasts have been validated through primary interviews with the key industry participants. Inflation has not been factored into estimates and forecast of the market. Numbers may not add up due to rounding off.

## RESEARCH METHODOLOGY

The research methodology underlying this analysis incorporates primary and secondary sources, and tracks the following process:

- Information Procurement: This stage involves the procurement of market data or related information via different sources and methodologies.
- Information Analysis: This stage involves the analysis and mapping of all procured information. It also encompasses the analysis of data discrepancies observed across various data sources.
- Market Formulation: This stage involves placement of data points at appropriate market spaces to deduce viable conclusions. Analyst perspective and subject matter experts support these conclusions.
- Validation: This is the final stage and most important step in the process. An intricate model to twice validate the findings is used to finalize data-points for terminal calculations.
- The movement from stages 1 and 2 is designed to be bi-directional as the process follows to and from both stages. This is an integral data-filtration technique. The market formulation and validation stages are also structured to be reversible and run in parallel to ensure data accuracy and process flexibility.

- The process of market sizing and data-point identification runs throughout the analysis schedule. The process moves from stages 1 and 2 to stages 3 and 4, while maintaining the reversibility of stages 1 and 2 and stages 3 and 4. The cycle of market sizing and variable identification also keeps repeating until every data point is duly validated.

## SOURCES & MODELING

### **Databases**

This analysis has relied on company databases such as Hoovers to identify financial information, competitive landscape, and structure of the market participants. In addition, company databases are an important element to establish market sizing. Industry databases, such as PitchBook, and others, have been used to generate industry statistics and access expert opinions incorporated into our conclusions. Other sources include SME trade journals and pertinent databases from third-party vendors, which support the analysis of:

- Usage rates
- Procedure statistics
- Potential market-related statistics
- Information on unmet needs
- Regional expenditure pattern
- Investment information or opportunity-based statistics

Grand View Research internal databases of data points collected from previous research and information are also incorporated into the information procurement and analysis process. This analysis utilizes databases for various industry verticals and subindustry verticals, including:

- Healthcare services
- Healthcare payers and insurers

- Healthcare IT
- Contract research and contract manufacturing
- Healthcare providers
- Medical products
- Medical devices and equipment
- Medical supplies
- Medical services
- Pharma/Biotech (drugs)
- Therapeutic categories (oncology, immunology, and others)
- Life science tools

Secondary sources employed in this analysis include white papers and government statistics published by organizations such as the WHO, NGOs, the World Bank; publications by key opinion leaders; company filings; investor relations documents; analyst reports; broker reports; academic commentary; and wealth management publications.

### **Primary Interviews**

Primary interviews were conducted based on a predetermined sample size. The sample included a mix of industry experts and end users. The following participants were included in the discussion:

- Industry experts/key opinion leaders
- Healthcare practitioners

### **Models**

Information procured from secondary and primary initiatives are analyzed using tools/models, including:

- Identifying variables and establishing market impact
- Establishing market trends
- Analyzing future opportunities and market penetration rates by understanding product commercialization, regional expansion, etc.

- Analyzing reimbursement/regulatory trends and changes in market dynamics to establish future growth potential
- Analyzing sustainability strategies pursued by market participants in an attempt to determine the future course of the market
- Analyzing historical market trends and superimposing them on the current and future variables to determine year-on-year trends
- Understanding consumer base, procedure trends, and regulatory framework
- Keeping track of technological advancements in individual segments
- Determining and forecasting penetration via analyzing product features, proposed pricing, availability of internal and external substitutes, etc.
- Heuristic estimation of year-on-year sales by conducting primary interviews with:
  - Healthcare practitioners
  - Industry experts and key opinion leaders
  - Distributors

Base numbers are established by analyzing the following:

- Company revenue and market share (this list generally includes the analysis of revenue published by publicly listed manufacturers)
- Derivation of market estimates through analysis of parent markets (bottom-up approach)

Model selection: Demand-based, bottom-up approach and usage rates-based approach.

Penetration modeling for products includes:

- Product-sizing and forecasting by following a diffusion model based on S-curve growth
- Analysis of current usage rates and patterns to determine substitution rates
- Regression and variable analysis
- Identifying variables and assigning impact to determine growth
- QFD modeling for market share assessment
- Referring to historic data to establish base estimates
- Using exponential smoothing for forecasting
- User size-based penetration
- Analyzing current needs and determining penetration to estimate market size or sales
- Using unmet needs and capitalization rates to determine growth



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