BayMark HEALTH SERVICES
Leading Positive Change

2023 Nationwide Opioid Use Disorder Treatment Outcomes Report

Nicholas Van Dyke, PhD
Director, Clinical Outcomes and Research

Executive Summary

Medication-assisted treatment (MAT) is defined as the use of FDA-approved medications in combination with counseling and other psychosocial support services, delivered by a multi-disciplinary team of doctors, nurses and counselors. MAT offered through opioid treatment programs is widely recognized as the gold standard of care for the treatment of opioid use disorders.[3,4] An overwhelming amount of evidence in published research demonstrates the substantial benefits of MAT, including reductions in overdose deaths, drug use, criminal activity and risky health behaviors that increase risk for HIV and Hepatitis C.[3-6]

The current paper adds to existing literature and reports nationwide treatment outcomes for a sample of approximately 39,000 patients enrolled in BayMark Health Services' outpatient opioid use disorder treatment programs since 2020. BayMark is a leading provider of evidence-based opioid use disorder treatment services in North America.

The data indicate that patients show significant improvement in all of the measured clinical outcomes over time. Specifically:

- Illicit drug use decreases by 65% over the first three months in treatment, and decreases by an additional 23% throughout the course of treatment
- 32% reduction in substance use-related problems over the first two years in treatment
- Significant improvements (range: 12%-23%) in patient self-reported mental and physical health ratings over the first month in treatment
- 33% and 38% improvements in comprehensive mental and physical health assessment scores over the first two years in treatment, respectively
- 67% reduction in legal problems over the first two years in treatment
- 30% improvement in family/social relationships over the first two years in treatment
- 16% improvement in employment-related challenges over the first two years in treatment
- Ongoing experimental methods to improve outcomes for patients using fentanyl have increased retention by 7% and reduced illicit fentanyl use by 43% over the first three months in treatment

The clinical outcomes reported in the current paper indicate the critical importance of keeping patients enrolled in treatment where they get better over time. They also add to the evidence that MAT as provided by opioid treatment programs and office-based opioid treatment programs results in meaningful improvements in clinical outcomes.

Communications regarding this report can be addressed to Research@baymark.com
For all other inquiries, email Media@baymark.com

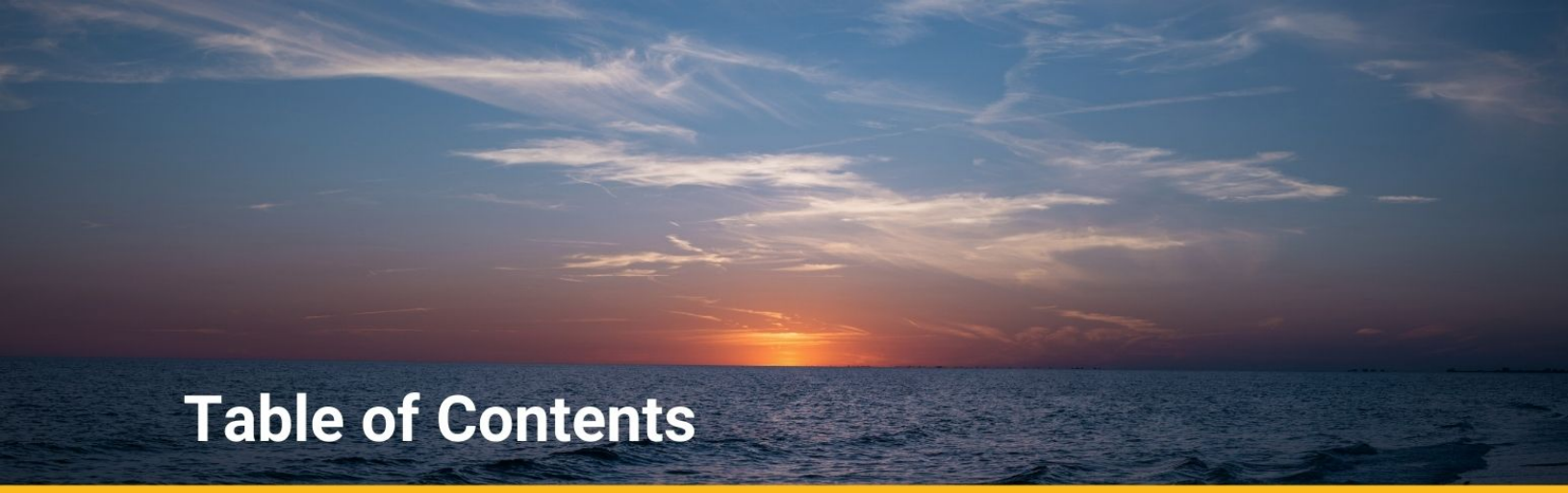


Table of Contents

01. General Introduction

The opioid epidemic and increasing presence of potent synthetic opioids (chiefly fentanyl) continue to cause a heavy toll on society.[1] Rapid increases in the number of overdose deaths between 2019 and 2020 was driven by synthetic opioids – primarily fentanyl.[14] Indeed, provisional data from the CDC reports that the majority of the more than 107,000 drug overdose deaths involved synthetic opioids.[2,14]

Medication-assisted treatment (MAT), defined as the use of FDA-approved medications in combination with counseling and other psychosocial support services delivered by a multi-disciplinary team of doctors, nurses and counselors, is widely recognized as the gold standard of care for the treatment of opioid use disorders (OUD).[3,4] An overwhelming amount of evidence in published research demonstrates the substantial benefits of MAT.[3,4] Frequently reported examples of MAT's effectiveness include reductions in overdose deaths and maladaptive health behaviors that increase risk for HIV and Hepatitis C, reduced drug use, and criminal activity. Indeed, it is commonly reported that MAT is associated with significant cost reductions in healthcare and the criminal justice system.[5,6]

The current paper adds to historical data on the effectiveness of MAT and reports patient demographics and treatment outcomes for a sample of approximately 39,000 patients who received/are receiving outpatient MAT (methadone and buprenorphine) services in BayMark Health Services' OTPs and OBOTs between 2020 and 2022. **To our knowledge, this is the largest reported data set of OUD treatment outcomes available today.** Patient demographics and outcomes data was compiled from available electronic health records systems and from reliable and valid assessments and questionnaires administered to patients as part of BayMark's internal research program.[7]

The timeframe of reporting includes the unprecedented COVID-19 pandemic, which contributed to a measurable and sustained impact on treatment outcomes. Moreover, the past few years are associated with rapid increases in the presence, availability, and subsequent quantities of fentanyl used by new and existing patients. Fentanyl has introduced significant challenges for MAT providers in the form of more difficult medication inductions, the likely need for higher peak doses than suggested by traditional therapeutic guidelines, and increased rates of early treatment dropout.

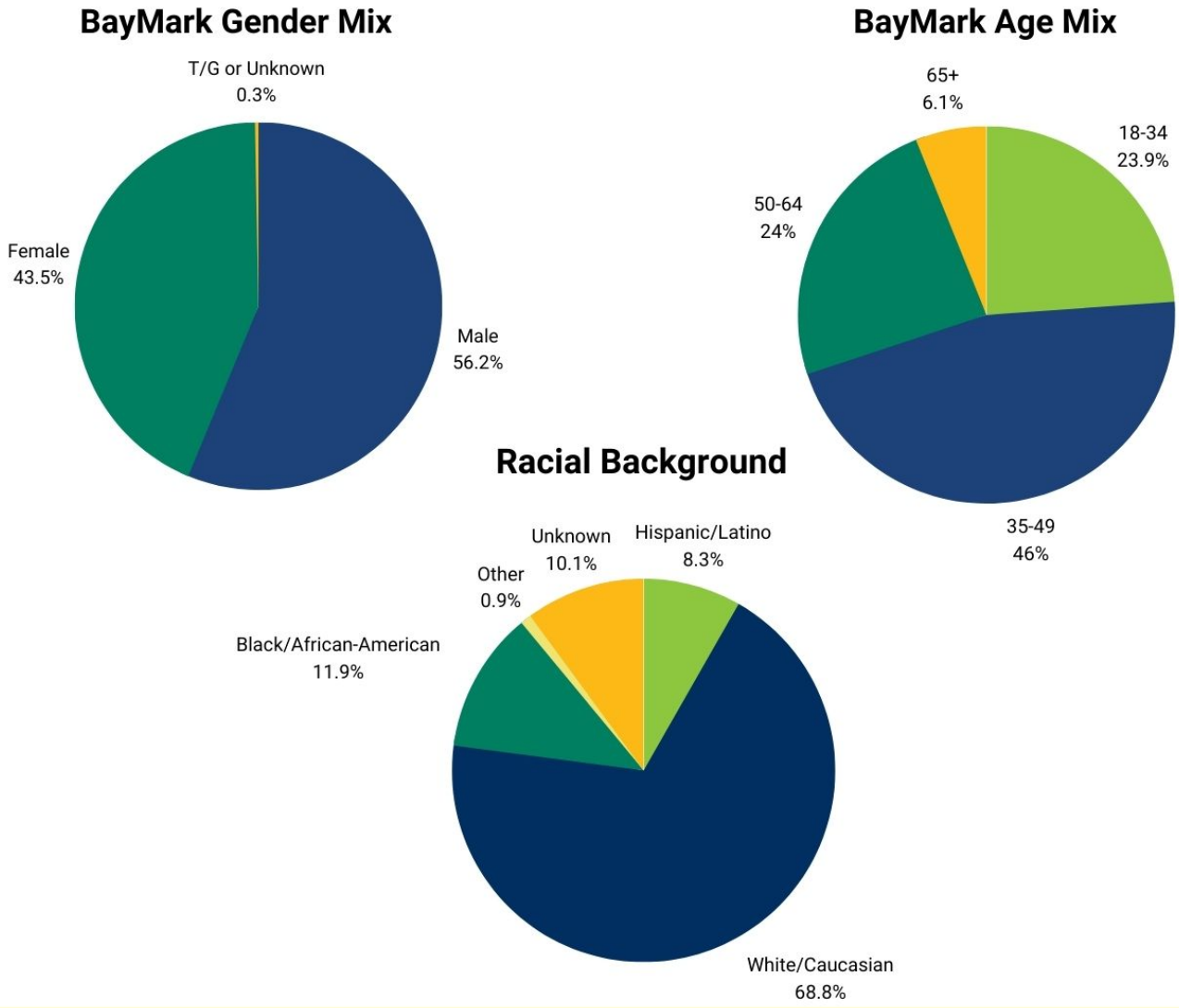
A brief discussion of the findings, the limitations, and future directions appears in the conclusions section toward the end of the document.

02. Patient Demographics

Patient demographics for the sample of 38,900 (98.9% OTPs; 1.1% OBOTs) patients are reported in Figure 1. The sample of patients was majority male (n=21,901) with an average age of 43.0 years old (SD=16.2; Range=18-35). The largest age group consisted of adults between 35 and 49 years of age.

With regard to patients' self-reported racial identity, the majority of the sample reported White/Caucasian (n=29,175; 75% of sample), followed by Black/African-American (n=5,057; 13%), Hispanic/Latino (n=3,501; 9%), and unknown/other (n=778; 2%). Patients identifying as American Indian/Alaskan Native, Asian, Native Hawaiian/Pacific Islander, or multiracial each represented less than 1% of the sample (total n=389). Notably, the attained racial percentages are similar to recent US Census data, which is likely due in part to the large sample size and expansive geographic area covered by included clinics[8].

Figure 1. Patient Demographics



03. Treatment Retention and Drug Test Outcomes

Treatment Duration and Length of Stay

Published literature frequently points to the critical importance of keeping patients active in treatment to achieve the best outcomes.[10,11] Indeed, measures of treatment retention and/or length of stay are commonly linked with outcomes such that longer treatment durations are associated with reductions in illicit drug use and craving, improved mental and/or physical health, and other psychosocial outcomes.[10,11] It is frequently reported that the best outcomes occur beyond one continuous year in treatment.[12]

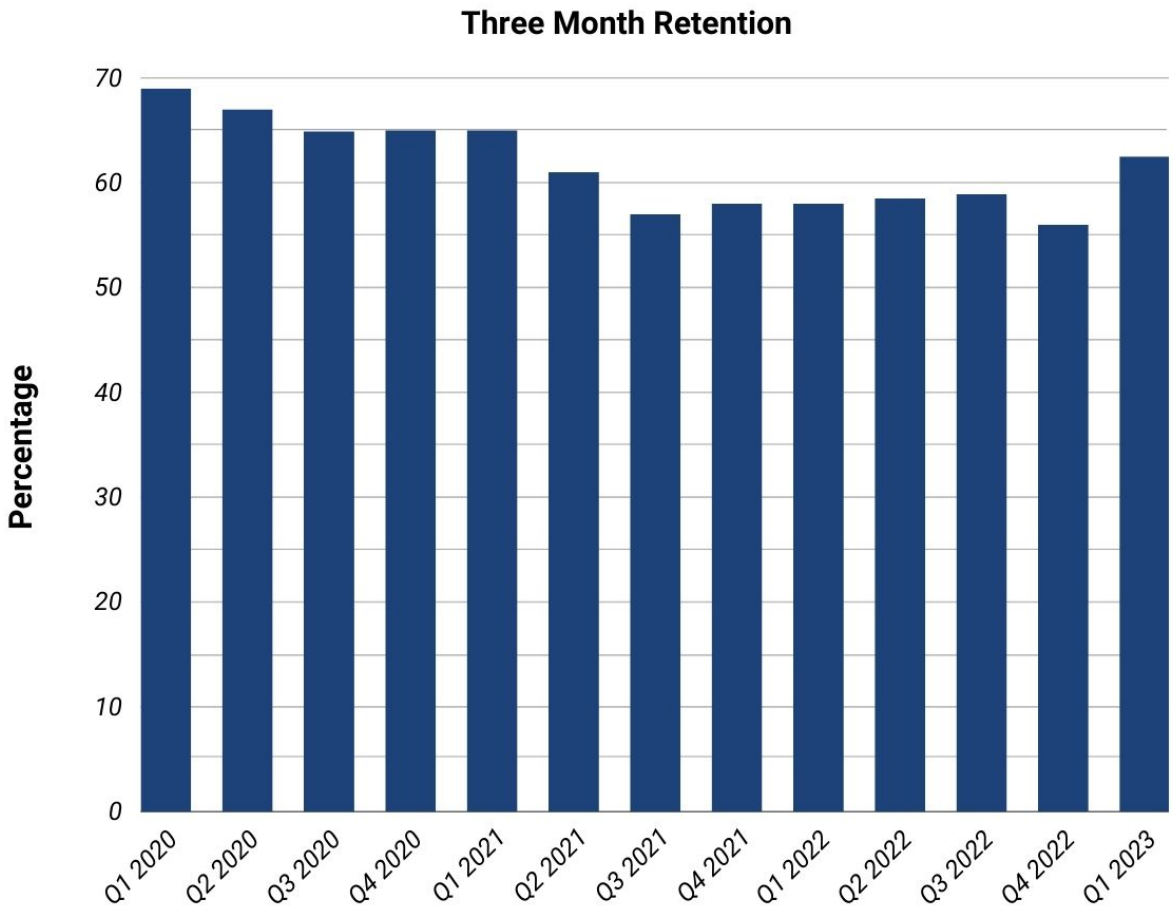
The current paper reports treatment durations in multiple ways. First, the overall average length of stay (admission to discharge) for newly admitted patients was 1.50 years. At the time of data extraction, patients actively enrolled in treatment had an average of 3.20 years in treatment. Next, the percentage of newly admitted patients who remained in treatment for at least the first three months (measured as first to last medication days) is also reported. This time period was selected as an easily understood and commonly reported metric in the field. Moreover, separate internal analyses indicate that more than 50% of newly admitted patients who stay in treatment for the first three months will remain in treatment for more than one year. If patients stay for 120 days, over 76% will remain in treatment for at least one year.

Treatment Retention and Drug Test Outcomes

Retention Over First Three Months of Treatment

Figure 2 reports the average three month retention rates by calendar quarter over the past few years. The data are organized with a three month delay such that the average retention rates in the figure reflect patients admitted to treatment in the three months prior. Average three-month retention rates ranged from 56.5% to 69.4%. Notably, the decreases in retention from Q1 2020 through Q3 2021 were likely a result of challenges associated with the COVID-19 pandemic, proliferation of fentanyl and other synthetic opioids throughout the country, and significant challenges in recruiting and retaining clinical staff. Comparatively, average three month retention through 2019 was ~67%. Thus, the year 2020 was associated with a significant decrease in retention and current retention rates remain significantly lower than historical rates.

Figure 2. Retention over first three months of treatment



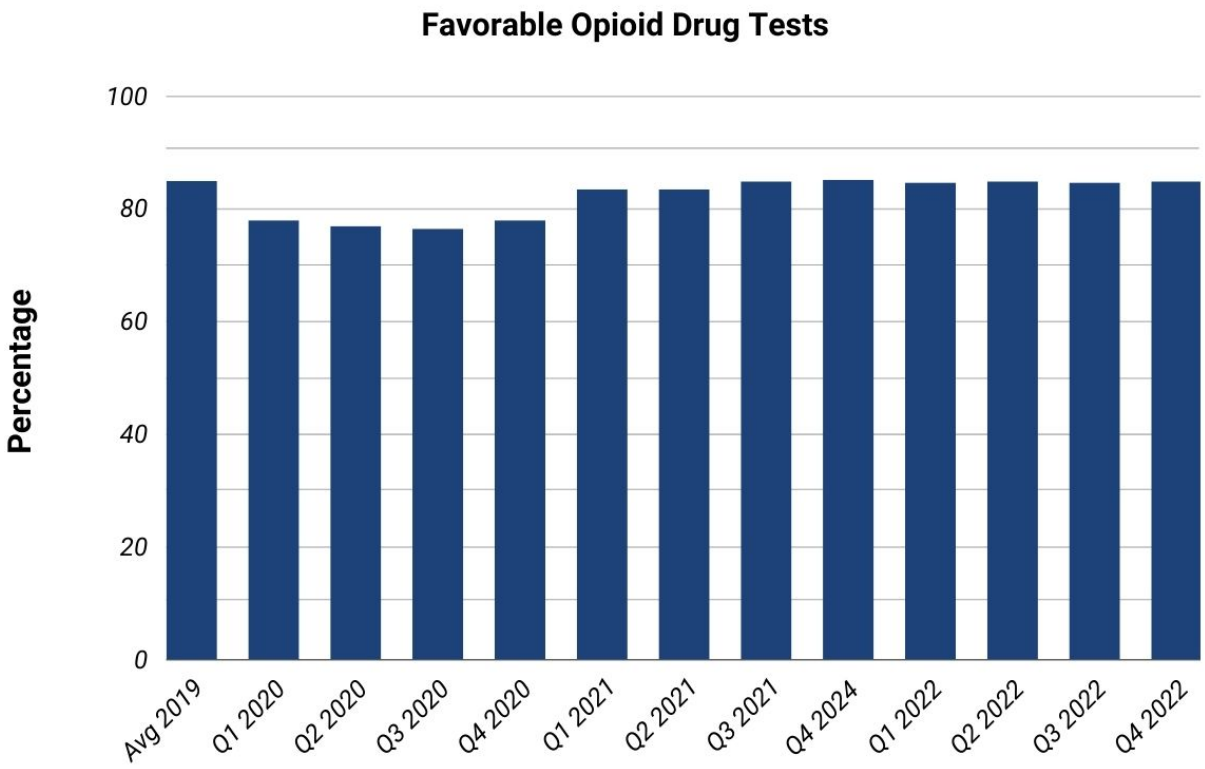
Treatment Retention and Drug Test Outcomes

Illicit Opioid Use: Urine Drug Test and Patient Self-Reported Use

Primary measures of MAT treatment effectiveness are related to patients' ongoing use of illicit opioids. Drug use behaviors are typically assessed by laboratory- confirmed urine drug tests, self-reported use, and with questionnaires/assessments that probe other substance use behaviors.

Figure 3 reports the percentage of all administered drug tests that were favorable (i.e., negative test result for drugs) for illicit opioids over time. BayMark consistently finds that approximately 85% of all opioid drug tests do not contain illicit opioids. There was a noticeable decrease in favorable test rate (more illicit drug use) throughout 2020, but rates have stabilized through 2021 and 2022.

Figure 3. Percentage of Favorable Opioid Drug Tests



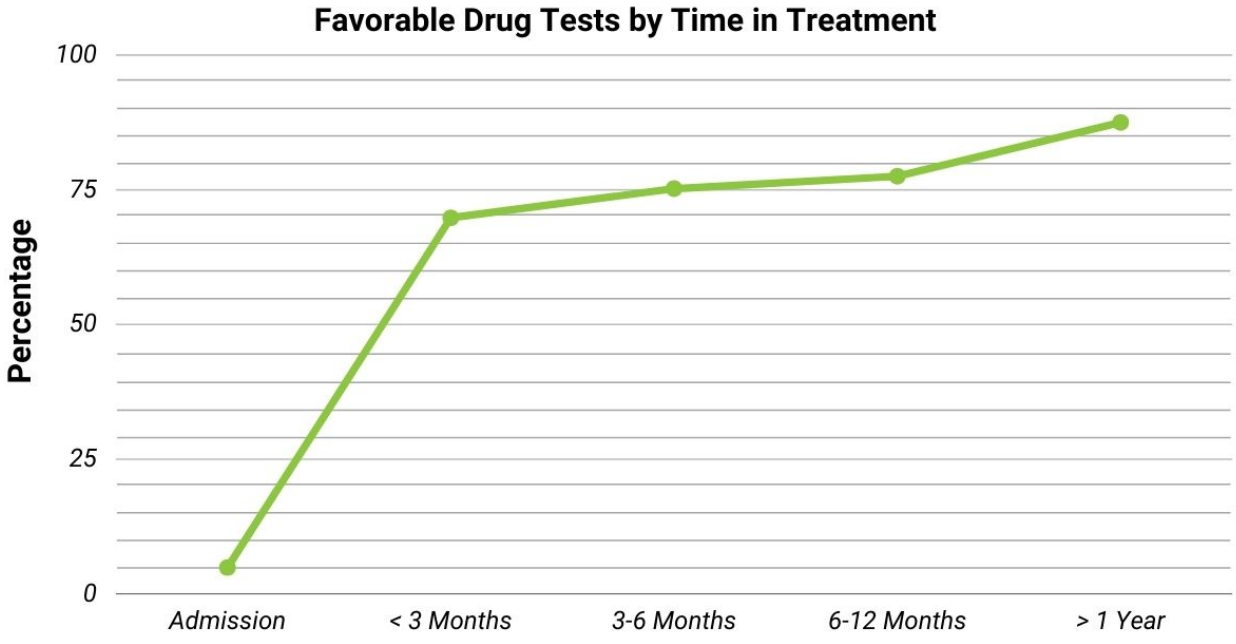
Treatment Retention and Drug Test Outcomes

Favorable Drug Test Rates

It is expected that favorable drug test rates will vary considerably by patients' time in treatment. Figure 4 graphs the improvement in favorable opioid test rates as a function of time. At admission virtually 100% of patients are using illicit opioids as reflected by the very low favorable test rate. However, almost 70% of drug tests administered to patients within their first three months in treatment do not contain illicit opioids. This percentage increases to almost 88% among patients who have been in treatment for more than one year. Together, this indicates a rapid reduction in illicit opioid use over the first three months, and modest but sustained reductions in illicit use thereafter.

Almost **70%** of drug tests administered to patients within their **first three months** in treatment **do not** contain illicit opioids.

Figure 4. Favorable Drug Tests by Time in Treatment



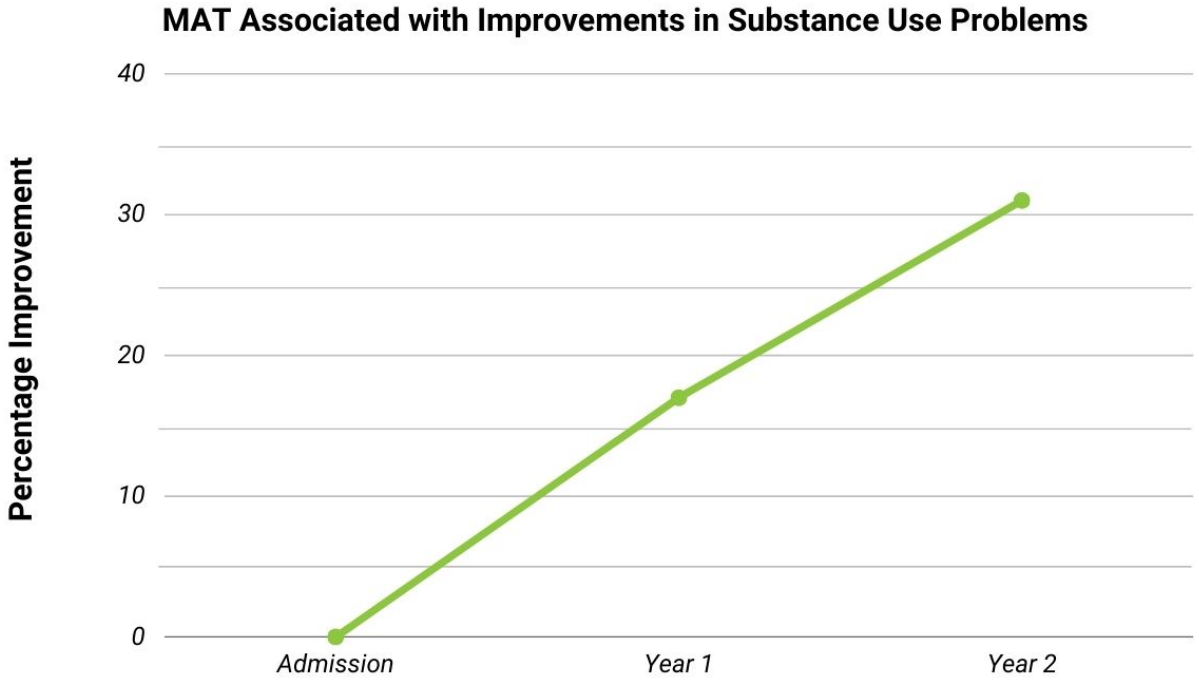
Treatment Retention and Drug Test Outcomes

Substance Use Problems Improvement Over Time

Patient samples also regularly self-report recent drug use in terms of quantity of drug used per day and the number of days of use over a designated time period (typically the past month). 18% of recently sampled patients reported past month illicit opioid use on an average of 9.1 days/month and reported using an average of 2.0 grams of opioids daily.

Improvements in problems related to substance use were assessed with validated assessments commonly used in the field, such as the Addiction Severity Index (ASI)[7]. Figure 5 graphs improvements in substance use-related problems from the ASI by displaying the percentage improvement at the end of the first and second years of treatment compared with baseline (admission). Significant improvements in substance use problems were found over each of the first two years in treatment compared with baseline.

Figure 5. Substance Use Problems Improve Over Time



04. Patient Health Data Findings

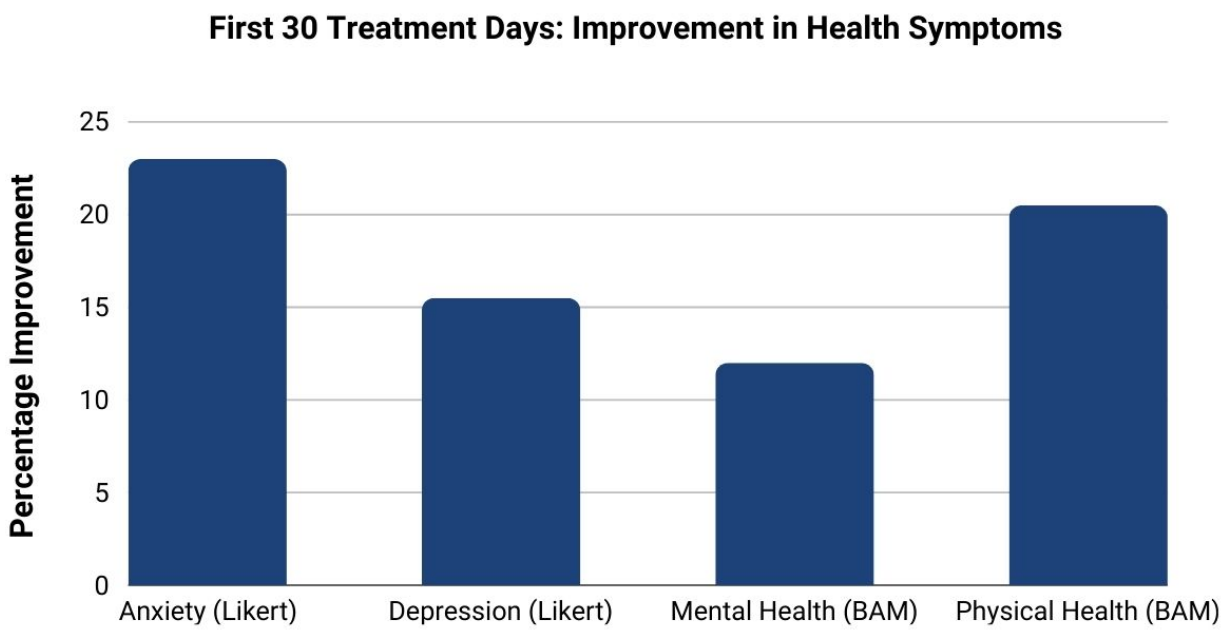
Data Findings

Health Symptom Improvements Over First 30 Treatment Days

All sampled patients received a minimum of one hour of monthly counseling. In practice, many patients exceeded this minimum, especially in the early phases of treatment. Patient health outcomes were assessed using a variety of validated questionnaires and assessments routinely administered in distinct intervals. Among these include commonly used tools such as the ASI, the Brief Addiction Monitor (BAM), and a variety of Likert scales asking patients to self-report current or recent health ratings.[7,12] Use of varied assessments that target different time intervals allows for a more thorough understanding of patients' day-to-day health and prolonged changes in health over longer time periods.

Figure 6 displays percentage improvements in health ratings over the first 30 days in MAT treatment measured by self-report Likert scales and the health portions of the BAM. The figure reports improvements on all health indicators. Average baseline mental and physical health ratings were in the mild to moderate severity range, which is common among patients in outpatient MAT programs.

Figure 6. Health Symptom Improvements Over First 30 Treatment Days

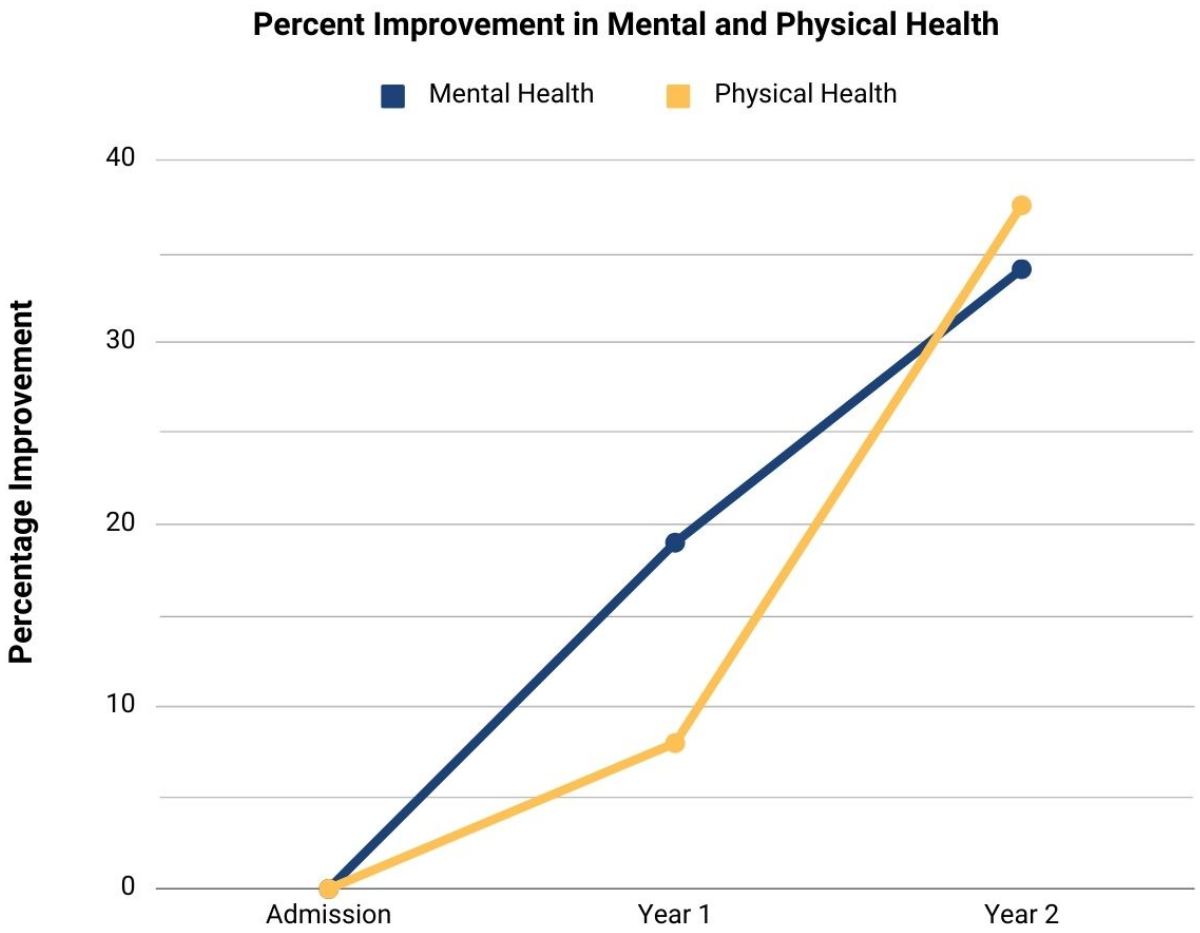


Data Findings

Mental and Physical Health Improvements Over First 2 Years

Figure 7 displays patients' improvements in mental and physical health from the ASI by reporting percentage improvements at the end of the first and second years in treatment compared with admission (baseline). The figure indicates significant improvement in patients' mental and physical health symptom profiles over the first two years in treatment.

Figure 7. Mental and Physical Health Improvements

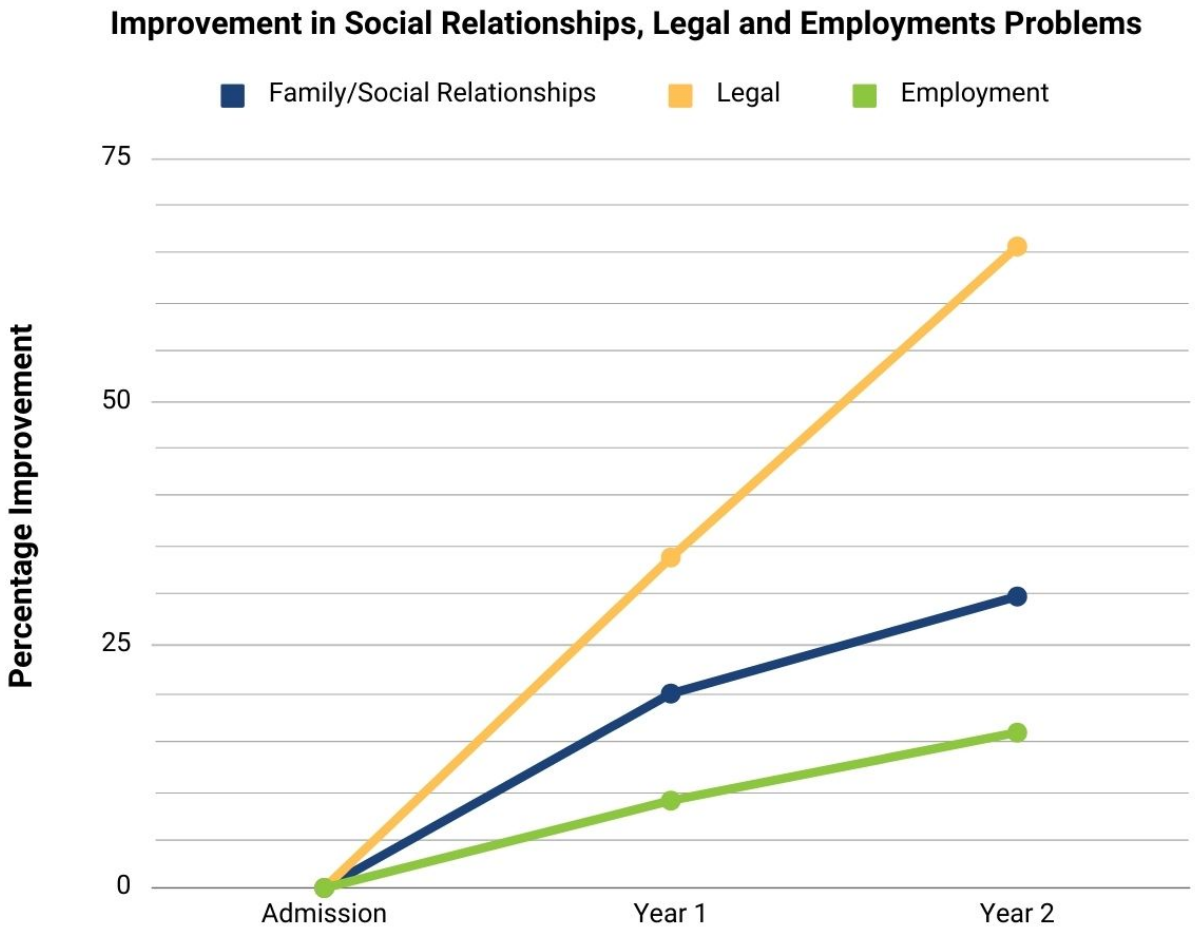


Data Findings

Legal Problems, Employment Rates, and Social Relationships

Other commonly measured treatment outcomes fall under general the categories of: 1) Social relationships; 2) Legal problems; and 3) Employment/financial challenges. All three outcome categories are measured by the respective scales from the ASI assessment, and are displayed in Figure 8. The data indicate percentage improvements in each category over the first two years in treatment, compared with admission (baseline).

Figure 8. Social Relationships, Legal and Employment Improvements



05. Unique Implications of Widespread Fentanyl Use

Patients using fentanyl spent **significantly less** time in treatment (almost 50% fewer days), were admitted with **more severe** health profiles and diagnosed mental and physical health conditions.

Within the past year, fentanyl testing expanded to all clinics as part of standard laboratory-confirmed drug test panels. Since then, illicit fentanyl has been detected in 23.2% of all administered drug tests. This number reflects test rates for all patients, including stable patients that have significantly reduced or are no longer using fentanyl. However, fentanyl was detected in over 62% of urine drug tests among patients within their first three months of treatment. Trends in the drug test data indicate that fentanyl use is increasing over time.

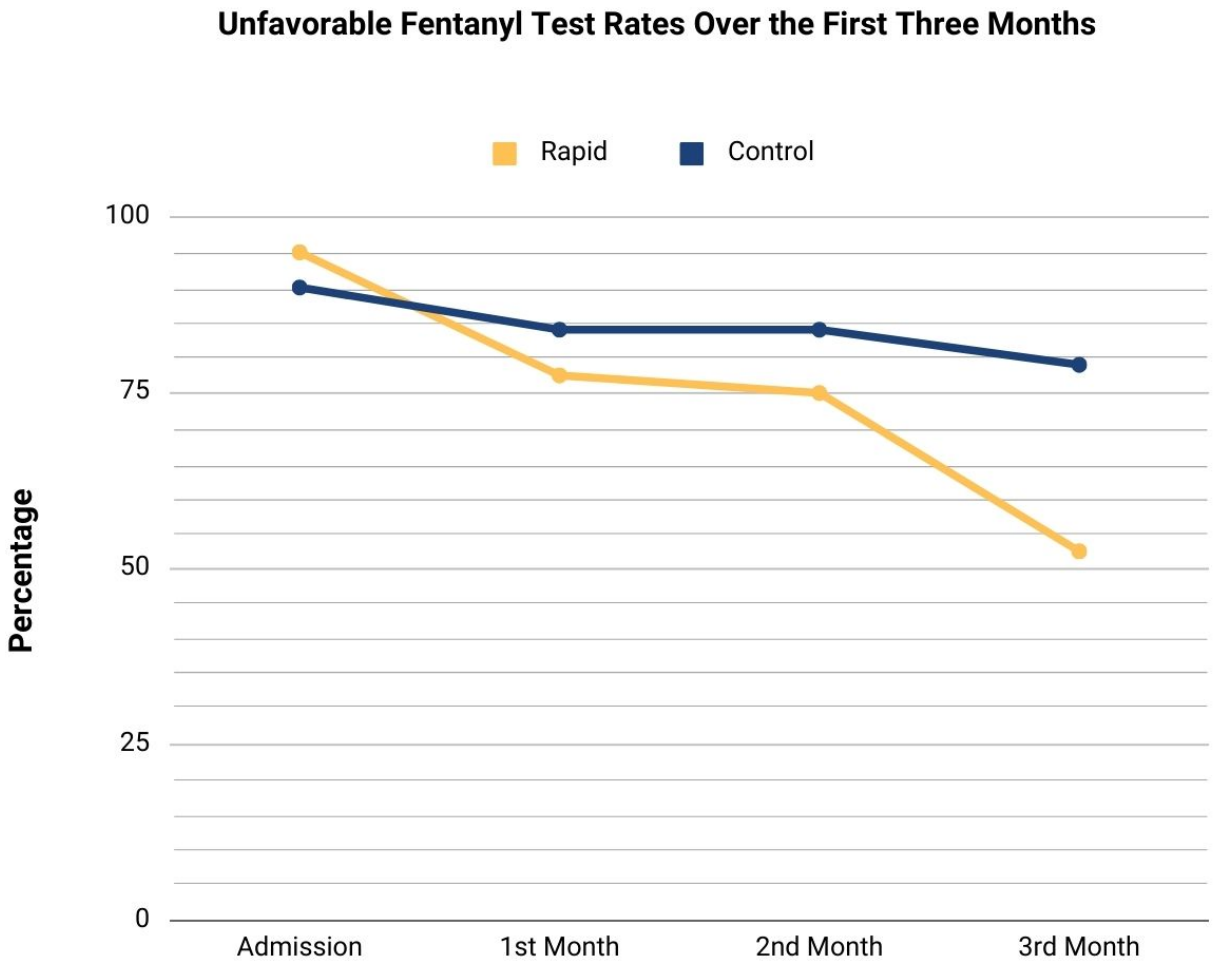
Preliminary analyses found that treatment outcomes among patients with unfavorable fentanyl drug tests were worse than patients with favorable fentanyl tests. Patients using fentanyl spent significantly less time in treatment (almost 50% fewer days), were admitted with more severe health profiles and diagnosed mental and physical health conditions, had a higher prevalence of polysubstance use, and showed less improvement in reported outcomes over time compared with patients not using fentanyl.

Early findings from an ongoing internal experimental protocol designed to improve outcomes for patients using fentanyl as their primary drug of choice have produced promising results. The protocol specifically targets higher methadone dosing with the hypothesis that the strong agonist composition of fentanyl may necessitate more rapid upward dose titration and/or higher therapeutic doses than what has traditionally been suggested for non-fentanyl opioids.

Patients in the experimental protocol were safely brought to therapeutic methadone levels (often referred to doses between 80 mg – 120 mg) within 10 days and were compared with patients on traditional dosing schedules who reached comparable medication doses in ~30 days. All patients were evaluated by physician providers prior to participation and were deemed to have sufficient physical and medical ability to participate.

Early preliminary analyses found improved retention and reduced fentanyl use among patients in the experimental protocol. Three month retention was 77%, which is 7% higher than the overall average year-to-date retention at the participating clinics. Moreover, the most recent data show an almost 60% retention rate five months after admission. With regard to fentanyl drug test rates, Figure 9 reports that the percentage of unfavorable fentanyl drug tests over the first three months in treatment is significantly lower among patients receiving accelerated dosing compared with patients on traditional dosing schedules.

Figure 9. Experimental Protocol Contributes to Reduced Illicit Fentanyl Use



06. Conclusions

BayMark's outpatient programs are successful at keeping patients in treatment, and patients who stay in treatment get better over time and have fewer physical and mental health issues.

The data reported in the current paper indicate that BayMark's programs have been successful at retaining patients in treatment. BayMark's focus on critical early treatment periods (often the first few months of treatment) contributes to sustained retention and average treatment durations that exceed the commonly-reported benchmark of a minimum of one year in treatment.

The data also indicate that patients who stay in treatment get better over time. This is evidenced by measured improvements in several important outcomes over time. Illicit drug use and drug-related problems declined rapidly over the first few months in treatment and continued to decline throughout patients' tenure in the program.
Mental and physical health symptoms, measured using distinct assessments over multiple time periods, improved significantly throughout the course of treatment.
The data also found improvement in family and social relationships, fewer legal problems, and fewer employment-related problems as a function of time in treatment.

The measured improvements in the reported outcomes are significant, and likely due in part to the comprehensive care offered in the programs. Patients regularly complete counseling sessions and build relationships with clinic staff and other patients. While not measured in the current data, the supportive environment offered in the treatment programs likely contributed to improved retention and outcomes.

Preliminary data indicates that individuals who use fentanyl have worse treatment outcomes than patients that primarily use other opioids. As such, treatment providers need to consider methods to improve outcomes for these patients. One such method involves identification of appropriate agonist medication dosing patterns for patients using fentanyl. The potency of fentanyl may necessitate more rapid upward dose titrations and/or higher therapeutic doses than what has traditionally been used for patients using less potent opioids (e.g., heroin). Early preliminary findings from the reported internal experimental protocol designed to bring patients to therapeutic doses more rapidly has led to improved retention, and significantly fewer unfavorable illicit fentanyl drug tests compared with patients on traditional dosing protocols.

With regard to limitations, each reported outcome variable currently has a limited ability to communicate with other outcomes. In order to best understand the nuances of the data and develop more sophisticated prediction models, more expansive data-extraction and reporting capabilities needs to be developed. BayMark has made considerable progress in this area, and will continue to work toward this goal in the near future.

Overall, the current data supports the efficacy of MAT, as delivered by multi-disciplinary teams in structured treatment programs emphasizing the combination of medication and psychosocial support, as the gold standard for the treatment of opioid use disorders. Use of MAT and the comprehensive care offered by specialized OUD treatment facilities is more important than ever given the proliferation of fentanyl and other potent synthetic opioids. Together, the field needs to continue to explore methods to keep patients engaged in treatment services where patients are benefitting from a number of tangible improvements in their lives.

07. References

1. Humphreys, K., Shover, C. L., Andrews, C. M., Bohnert, A. S., Brandeau, M. L., Caulkins, J. P., ... & Timko, C. (2022). Responding to the opioid crisis in North America and beyond: recommendations of the Stanford–Lancet Commission. The Lancet, 399(10324), 555-604.
2. Kariisa M, O'Donnell J, Kumar S, Mattson CL, Goldberger BA. Illicitly Manufactured Fentanyl–Involved Overdose Deaths with Detected Xylazine — United States, January 2019–June 2022. MMWR Morb Mortal Wkly Rep 2023; 72:721–727. DOI: http://dx.doi.org/10.15585/mmwr.mm7226a4
3. Braun, H. M., & Potee, R. A. (2023). Individualizing methadone treatment with split dosing: An underutilized tool. Journal of Substance Use and Addiction Treatment, 209096.
4. Adams, J. A. (2023). STIGMA: THE GREATEST BARRIER TO EFFECTIVE TREATMENT OF OPIOID USE DISORDER. Maryland Medical Journal, 24(1).
5. Mohlman, M. K., Tanzman, B., Finison, K., Pinette, M., & Jones, C. (2016). Impact of medication-assisted treatment for opioid addiction on Medicaid expenditures and health services utilization rates in Vermont. Journal of substance abuse treatment, 67, 9-14.
6. Jones, S. (2013). Medication-assisted treatment for opioid-dependent individuals. Southern Connecticut State University.
7. McLellan, A. T., Kushner, H., Metzger, D., Peters, R., Smith, I., Grissom, G., Pettinati, H., & Argeriou, M. (1992). The fifth edition of the Addiction Severity Index. Journal of Substance Abuse Treatment, 9(3), 199–213. https://doi.org/10.1016/0740-5472(92)90062-S
8. United States Census Bureau (2022). https://www.census.gov/quickfacts/fact/table/US/PST045222
9. Ma, J., Bao, Y. P., Wang, R. J., Su, M. F., Liu, M. X., Li, J. Q., . . . Lu, L. (2018). Effects of medication-assisted treatment on mortality among opioids users: a systematic review and meta-analysis. Mol Psychiatry. doi:10.1038/s41380-018-0094-5.
10. Williams, A. R., Mauro, C. M., Feng, T., Wilson, A., Cruz, A., Olfson, M., ... & Chiodo, L. (2023). Performance measurement for opioid use disorder medication treatment and care retention. American Journal of Psychiatry, 180(6), 454-457.
11. Abuse, N. I. o. D. (2018). Principles of Drug Addiction Treatment: A Research-Based Guide (Third Edition). Retrieved from https://nida.nih.gov/sites/default/files/podat-3rdEd-508.pdf
12. Cacciola JS, Alterman AI, Dephilippis D, Drapkin ML, Valadez C Jr, Fala NC, Oslin D, McKay JR. Development and initial evaluation of the Brief Addiction Monitor (BAM). J Subst Abuse Treat. 2013 Mar;44(3):256-63. doi: 10.1016/j.jsat.2012.07.013. Epub 2012 Aug 14. PMID: 22898042; PMCID: PMC3602977.
13. National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. Hyattsville, Maryland. 2023.
14. Understanding the Opioid Overdose Epidemic, Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Hyattsville, Maryland. 2023.

About BayMark Health Services

The disease of addiction is an epidemic and a crisis in the United States. As the leader in opioid use disorder treatment, BayMark is dedicated to providing innovative, individualized Medication-assisted treatment (MAT) and other support services to the patients and communities we serve.

Offering a Complete Continuum of Care Through:

Opioid Treatment Programs (OTPs)
Office-Based Opioid Treatments (OBOTs)
Intensive Outpatient Programs
Partial Hospitalization Programs
Withdrawal Management Services (Detox)
Inpatient and Residential Treatment Services
Mental Health Treatment Services

BayMark HEALTH SERVICES
Leading Positive Change