California Health Benefits Review Program

Analysis of California Senate Bill 888: Substance Use Disorder Services: Contingency Management

A Report to the 2019–2020 California State Legislature

April 16, 2020

CALIFORNIA
HEALTH BENEFITS REVIEW PROGRAM

Key Findings

Analysis of California Senate Bill 888: Substance Use Disorder Services: Contingency Management

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CALIFORNIA HEALTH BENEFITS REVIEW PROGRAM

AT A GLANCE

The version of California Senate Bill 888 analyzed by CHBRP would, as law, regulation, and funding allow, require the Department of Health Care Services (DHCS) to cover contingency management (CM) as an aspect of substance use disorder (SUD) treatment for approximately 10.9 million Medi-Cal beneficiaries.

Medical effectiveness evidence (and evidence of effect duration) for SUD treatment with CM varies by SUD. CM can increase during-treatment abstinence for alcohol, cannabis, opioids, stimulants (including methamphetamines), and tobacco use disorders. CM can also increase posttreatment (months) abstinence for cannabis, opioid, and tobacco use disorders. *Limited* evidence suggests CM increased abstinence does not persist beyond treatment for stimulant use disorder.

Benefit coverage for SUD treatment is standard for Medi-Cal beneficiaries. However, federal law and regulation are unclear as to whether Medicaid funds can be used for CM. This analysis models one SUD more associated with acute impacts, overdose deaths, and one SUD that is less so. Both models scale: twice participants would mean twice costs and outcome impacts.

For 1,000 participants, annual cost of methamphetamines use disorder treatment with CM could cost $829,600 (without CM, $460,800). Although CM-increased abstinence may not persist posttreatment, a reduction in premature overdose deaths during treatment could occur.

For 1,000 participants, annual cost of tobacco use disorder treatment with CM could cost $317,645 (without CM, $111,350). With CM-increased abstinence, 29 more participants would be abstinent at 6 months, leading to a reduction in related negative health impacts.

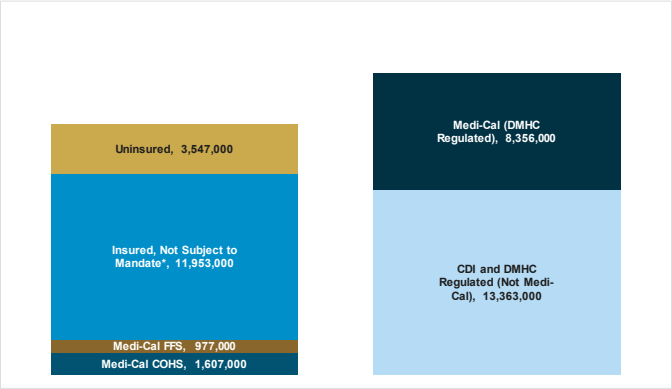
Models of CM for other SUDs would vary depending on the SUD, the particulars of treatment, and the evidence of effectiveness.

BILL SUMMARY[1]

As law, regulation, and funding allow, Senate Bill (SB) 888 would require the Department of Health Care Services (DHCS) to cover contingency management (CM) programs as an aspect of substance use disorder (SUD) treatment for Medi-Cal beneficiaries. It would also require DHCS to provide CM guidance and training.

SB 888 would be relevant to the benefit coverage of all 10.5 million Medi-Cal beneficiaries. As noted in Figure A, these beneficiaries can be enrolled in health plans regulated by the Department of Managed Care (DMHC), in County Organized Health System (COHS) plans, or be primarily associated with Medi-Cal's fee-for-service (FFS) program.

Figure A. Health Insurance in CA and SB 888



Source: California Health Benefits Review Program, 2020.
Notes: *Medicare beneficiaries, enrollees in self-insured products, etc.

CONTEXT

Contingency Management

CM related to SUD treatment generally involves giving patients tangible rewards such as prizes, cash, or vouchers to reinforce goal behaviors, such as abstinence, medication adherence, or greater/continued engagement with treatment. SUD services such as counseling are already a Medi-Cal covered benefit. CM is intended as a way to improve the outcomes of these

[1] Refer to CHBRP's full report for full citations and references.

services. CM is not a benefit that directly covers a health care screening, treatment, service, or item. Rather it is an incentive, analogous to, for example, incentive payments for members participating in wellness programs to encourage healthy behaviors. The total cash value a patient could receive through CM is generally under $500.

CM can be considered to be subject to prohibitions against kickbacks or limits on inducements. For example, the Centers for Medicare and Medicaid Services (CMS) generally imposes an annual maximum limit of $75 on incentives provided to Medicaid beneficiaries. Such laws and regulations are intended to prevent fraud, waste, and abuse — to prevent promotion of unnecessary care or efforts to direct patients toward particular treatment programs or health insurance plans. It is unclear, however, whether such prohibitions would be applied to CM for SUD. The federal Department of Health and Human Services Office of Inspector General has released an advisory opinion, taking the position that CM at a specific rigorous treatment program did not violate anti-kickback statutes, and the federal Office of Inspector General is currently engaged in rulemaking to evaluate changes to anti-kickback laws, potentially allowing CM. Furthermore, CM has previously been allowed for Medicaid programs. In 2011 the Affordable Care Act (ACA) authorized a Medicaid Incentives for Prevention of Chronic Disease program for smoking cessation in five states, of which California was one, that offered value of more than $75 to participating beneficiaries. In addition, the Department of Veterans Affairs (VA) offers CM and the National Institute on Drug Abuse at the National Institutes of Health recommends CM for SUD treatment.

For this analysis, CHBRP has assumed that CM for SUD treatment programs would be allowed for Medi-Cal beneficiaries.

Treatment for Substance Use Disorders

Treatments for SUD include residential, inpatient, and outpatient care using behavioral therapy, counseling, and/or prescription medication. Mutual help groups (e.g., Alcoholics Anonymous, Narcotics Anonymous) also support those with SUD to quit substance use and maintain sobriety. CM is commonly used as an adjunct to treatments for SUD. Descriptions of treatment for methamphetamine use disorder and tobacco use disorder (modeled in two case studies presented in the *Benefit Coverage, Utilization, and Cost* section) follow.

In California, stimulants (including methamphetamine and other amphetamines) were the third most common drug reported for treatment admissions among people aged 12 years and older. Currently, there are no medications approved by the Food and Drug Administration (FDA) to treat stimulant use disorders. Standard care instead includes psychosocial interventions, including cognitive behavioral therapy and motivational interviewing. The rate of individuals seeking treatment for stimulant use disorders is generally low. Changes in brain function from high use of stimulants may also lead to an inability to control or stop stimulant use and increase risk of relapse. Approximately 61% of individuals using methamphetamine relapse within a year following treatment.

Tobacco use is the leading cause of premature morbidity and mortality in California. Effective treatments for tobacco cessation include behavioral therapies; telephone-based support and quitlines; text-message, print, and/or web-based cessation interventions; and FDA-approved medications. Former smokers recalled an average of 4.7 quit attempts before successfully abstaining.

For many patients with SUD, attitudinal barriers are the most significant barrier to treatment initiation and persistence. The stigma of addiction and the ability to acknowledge an SUD affect patient desire to seek care; even more so for those who have co-occurring psychiatric conditions. Many people with SUD believe they can solve the problem themselves.

Another barrier for patients participating in treatment specifically using CM is the requirement to travel to the provider's office, sometimes up to 2 to 3 times a week. This can cause more of a burden for patients who do not have flexible schedules and those who are living in areas with a shortage of providers administering CM programs.

IMPACTS

Medical Effectiveness

There is a *preponderance* of evidence that voucher-based and prize-based CM added to SUD outpatient treatment makes the treatment more effective in increasing abstinence. However, the effectiveness and the effect (duration of abstinence) varies by SUD:

- For alcohol use disorder, *limited* evidence suggests that CM increases during-treatment abstinence.
- For cannabis use disorder, there is a *preponderance* of evidence that CM increases during-treatment abstinence. *E*vidence is

inconclusive regarding increased posttreatment (months) abstinence.

- For opioid use disorder, there is a *preponderance* of evidence that CM increases during-treatment and posttreatment (months) abstinence and treatment retention.
- For stimulant use disorder (including methamphetamines), there is a *preponderance* of evidence that CM increases during-treatment abstinence. However, there is also a *preponderance* of evidence that CM increased abstinence does not persist posttreatment.
- For tobacco use disorder, there is *clear and convincing* evidence that CM increases during-treatment and posttreatment (months) abstinence.

Benefit Coverage, Utilization, and Cost

Currently CM services are not mentioned as a core Medi-Cal benefit. CM programs run by SUD providers may exist in California, but CHBRP is unaware of such services being reimbursed as Medi-Cal covered benefits.

SB 888 does not specify how the DHCS should implement CM for SUD. As the amount of funding that would be available, if any, is unknown, CHBRP has modeled a limited expansion — for only 1,000 beneficiaries — intending to provide two examples that could be scaled larger, depending on the amount of available funds. The cost of the scaling up would be roughly linear (twice as many participants would cost twice as much) although some administrative savings may be realized as scale increases.

CHBRP has modeled CM as an addition to outpatient treatment for two SUDs: stimulant (methamphetamine) use disorder treatment, an SUD for which acute impacts, such as overdose deaths are likely; and tobacco use disorder treatment, an SUD for which acute impacts are less common. Models of CM for other SUDs would vary, depending on the SUD, the particulars of treatment, and the evidence of effectiveness.

The actual design of CM programs may differ materially from these hypothetical examples, but the selected pair are similar to models in current use and to models that have been evaluated in the scientific literature.

Model 1: CM and Stimulant (Methamphetamine) Use Disorder Treatment

The first model is for a 12-week outpatient methamphetamine use disorder treatment program with and without CM. The treatment program includes counseling and urine testing, both of which are covered services for Medi-Cal beneficiaries.

The Model 1 treatment program has the following parameters:

- The CM can begin at any time during the year, but each beneficiary can only participate in one 12-week CM program.
- The SUD treatment program includes group counseling sessions. The maximum number of outpatient counseling sessions during the 12 weeks of CM is 24 (2 sessions per week).
- Urine samples are collected and tested at each group counseling sessions for a maximum of 24 times during the 12 weeks of CM.
- For each negative urine sample, participants receive a voucher for $20 (redeemable at program-selected vendors for food, toiletries, and other program-approved items).
- The maximum cash value of the CM program per participant is $480.

Based on published studies, for this model, CHBRP assumes an average of 90% attendance at group counseling sessions with CM compared to an average of 80% attendance at group counseling sessions for the SUD treatment program with no CM. CHBRP assumes all participants submit urine samples at each group counseling session they attend. CHBRP estimates 60% of the urine samples are negative for participants with CM compared to 40% for participants without CM.

In addition to the direct costs of the CM (vouchers and administration), the model projects higher attendance for the SUD treatment program with CM services, which generates additional costs for counseling and urinalysis.

Given these parameters and assumptions, CHBRP estimates the following annual costs to offer the 12-week treatment program to 1,000 Medi-Cal beneficiaries with methamphetamine use disorder:

- $460,800: SUD treatment without CM
- $829,600: SUD treatment with CM

There is not sufficient evidence to project applicable cost offsets or savings (such would result from reduced emergency department visits or hospitalizations) for intermittent or continuous abstinence during a 12-week SUD program.

Similarly, as there is not sufficient evidence to project additional posttreatment or long-term abstinence, no long-term offset or savings are projected.

Model 1: Public health impacts

Methamphetamine has taken over as the leading cause of overdose deaths in California (now surpassing opioid overdose deaths).

Although abstinence may not, even with CM, persist posttreatment, achieving periods of abstinence is a goal of treatment. In addition, as there is no FDA-approved medication to treat stimulant use disorder, CM to improve treatment engagement and abstinence may be the best treatment option available.

For every 1,000 Medi-Cal enrollees engaged in SUD treatment, adding CM would result in an increase in 5,280 stimulant-free urine samples (15,000 methamphetamine-free days) and an increase in engagement in treatment for stimulant use disorder by 2,400 group counseling sessions.

Although the quantitative impact of SB 888 on premature death associated with methamphetamine is unknown, it stands to reason that there could be a reduction in premature deaths due to overdose during periods of abstinence for as well an increase in productivity due to an increased ability to work for those who are abstinent.

Model 2: CM and Tobaccos Use Disorder Treatment

The second model is CM added to a tobacco use disorder treatment program. The treatment program, which runs for 4 weeks, consists of phone counseling sessions and nicotine patches mailed to participants' homes, both of which are covered services for Medi-Cal beneficiaries.

The Model 2 treatment program has the following parameters:

- The CM can begin at any time during the year, but each beneficiary can only participate in one 4-week CM program.
- The program includes individual phone counseling sessions no shorter than 10 minutes in duration. The maximum number of phone counseling sessions is 4. Nicotine patches are mailed to all participants who complete the first phone counseling session.
- For each participation in a phone counseling session, participants receive a $15 voucher (redeemable at program-selected vendors for food, toiletries, and other program-approved items).
- The maximum cash value of the CM program per participant is $60.

Based on published studies, for this model, CHBRP assumes approximately 95% of participants will utilize the first individual phone counseling session with CM compared to 85% of participants utilizing the first individual phone counseling session for the SUD treatment program with no CM. CHBRP estimates utilization will decrease to 65% by the last phone counseling session for the SUD treatment program with CM compared to 40% utilization without CM.

In addition to the direct costs of the CM (vouchers and administration), the model projects greater participation for the SUD treatment program with CM services, which generates additional costs for counseling.

Given these parameters and assumptions, CHBRP estimates the following annual cost to offer the 4-week treatment program to 1,000 Medi-Cal beneficiaries with tobacco use disorder:

- $111,350: SUD treatment without CM
- $317,645: SUD treatment with CM

CHBRP expects 13% greater increase is cessation at 6 months for participants in the SUD treatment with CM.

There is not sufficient evidence to project applicable cost offsets or savings (such would result from reduced emergency department visits or hospitalizations) for during treatment or following month's posttreatment abstinence.

Model 2: Public health impacts

Tobacco use is the leading cause of preventable illness and death in the United States and California. An estimated 17.1 years of potential life are lost per smoker due to smoking-related disease in California. Causes of premature death included premature birth, low birth weight, sudden infant death syndrome (SIDS), respiratory stress syndrome, lung cancer, heart disease, and asthma. There is evidence that smoking cessation can reverse negative health effects from tobacco and can produce similar reductions in morbidity and mortality that would be achieved through pharmaceutical interventions commonly prescribed for heart disease patients.

For every 1,000 Medi-Cal enrollees engaged in SUD treatment for tobacco use disorder, CHBRP estimates that adding CM treatment would result in 29 more enrollees abstinent from tobacco use at 6 months, likely leading to a reduction in relevant negative health impacts of tobacco use.

Long-Term Impacts

For those users who are able to sustain abstinence, SB 888 would reduce related morbidity and mortality. However, given limited evidence on sustained abstinence, the effects of SB 888 on long-term public health is uncertain.

Essential Health Benefits and the Affordable Care Act

Because SB 888 affects only the benefit coverage of Medi-Cal beneficiaries, it would not exceed essential health benefits (EHBs).

At the time of this CHBRP analysis, there is substantial uncertainty regarding the impact of the COVID-19 pandemic on premium rates and health plan enrollment, including how the pandemic will impact health care costs in 2021. Because the variance of potential outcomes is significant, CHBRP does not take these effects into account as any projections at this point would be speculative, subject to federal and state decisions and guidance currently being developed and released. In addition, insurers', providers', and consumers' responses are uncertain and rapidly evolving to the public health emergency and market dynamics

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The California Health Benefits Review Program (CHBRP) was established in 2002. As per its authorizing statute, CHBRP provides the California Legislature with independent analysis of the medical, financial, and public health impacts of proposed health insurance benefit-related legislation. The state funds CHBRP through an annual assessment on health plans and insurers in California.

An analytic staff based at the University of California, Berkeley, supports a task force of faculty and research staff from multiple University of California campuses to complete each CHBRP analysis. A strict conflict-of-interest policy ensures that the analyses are undertaken without bias. A certified, independent actuary helps to estimate the financial impact. Content experts with comprehensive subject-matter expertise are consulted to provide essential background and input on the analytic approach for each report.

More detailed information on CHBRP's analysis methodology, authorizing statute, as well as all CHBRP reports and other publications, are available at www.chbrp.org.

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POLICY CONTEXT

The California Senate Committee on Health has requested that the California Health Benefits Review Program (CHBRP)[2] conduct an evidence-based assessment of the medical, financial, and public health impacts of Senate Bill (SB) 888, Substance Use Disorder Services: Contingency Management.

Bill-Specific Analysis of SB 888, Contingency Management

Contingency management (CM) related to substance use disorder (SUD) treatment generally involves giving patients tangible rewards, such as prizes or vouchers, to reinforce positive behaviors, such as abstinence, medication adherence, or greater/continued engagement with treatment. Duration varies widely but CM is often available to an enrollee for about 12 weeks

Bill Language

As possible (below, see discussion of relevant laws and regulations) and as funding allows, SB 888 would require Medi-Cal to cover contingency management programs as an aspect of SUD treatment. It would also require the Department of Health Care Services (DHCS) to provide CM guidance and training.

The full text of SB 888 can be found in Appendix A.

Relevant Populations

If enacted, SB 888 would affect the health insurance of all Medi-Cal beneficiaries, a group of approximately 10.9 million Californians (28% of the state's population).

Analytic Approach and Key Assumptions

CM can be considered to be subject to prohibitions against kickbacks or limits on inducements. For example, the Centers for Medicare and Medicaid Services (CMS) generally impose annual maximum limit of $75 on incentives (Glass et al., 2020). Such laws and regulations are intended to prevent fraud, waste, and abuse — to prevent promotion of unnecessary care or efforts to direct patients toward particular treatment programs or health insurance plans. It is unclear, however, whether such prohibitions would be applied to CM for SUDs. The federal Department of Health and Human Services Office of Inspector General has released an advisory opinion, taking the position that CM at a specific rigorous treatment program did not violate anti-kickback statutes (HHS, 2018), and the federal Office of Inspector General is currently engaged in rulemaking to evaluate changes to anti-kickback laws, potentially allowing CM (HHS, 2008).

Furthermore, CM has previously been allowed for Medicaid programs. In 2011, the Affordable Care Act (ACA) authorized a Medicaid Incentives for Prevention of Chronic Disease program for smoking cessation in CA, CT, NH, NY, and WI (Witman et al., 2018), an effort with offered value of more than $75 to participating beneficiaries.

In addition, the Department of Veterans Affairs (VA) offers CM across its national health care system and has taken the position that CM is an effective treatment and not an inducement (VA, 2020). The National Institute on Drug Abuse at the National Institutes of Health recommends CM for SUDs treatment (NIDA, 2018a).

For this analysis, CHBRP has assumed that CM would be allowed for Medi-Cal beneficiaries.

[2] CHBRP's authorizing statute is available at www.chbrp.org/faqs.php.

Interaction With Existing Requirements

Health benefit mandates may interact and align with the following state and federal mandates or provisions.

California Policy Landscape

California law and regulations

CHBRP is unaware of a California law or regulation specifically related to CM and Medi-Cal.

Similar requirements in other states

As noted above, in 2011 the Affordable Care Act (ACA) authorized a Medicaid Incentives for Prevention of Chronic Disease program for smoking cessation in CA, CT, NH, NY, and WI (Witman et al., 2018), an effort with offered value of more than $75 to participating beneficiaries.

Federal Policy Landscape

As noted above, federal considerations regarding anti-kickback and incentive rules may limit use of CM for SUDs for Medi-Cal beneficiaries.

Affordable Care Act

A number of ACA provisions have the potential to or do interact with state benefit mandates. Below is an analysis of how SB 888 may interact with requirements of the ACA as presently exists in federal law, including the requirement for certain health insurance to cover essential health benefits (EHBs).[3,4]

Any changes at the federal level may impact the analysis or implementation of this bill, were it to pass into law. However, CHBRP analyzes bills in the current environment given current law and regulations.

Essential Health Benefits

Nongrandfathered plans and policies sold in the individual and small-group markets are required to meet a minimum standard of benefits as defined by the ACA as essential health benefits (EHBs). In California, EHBs are related to the benefit coverage available in the Kaiser Foundation Health Plan Small Group Health Maintenance Organization (HMO) 30 plan, the state's benchmark plan for federal EHBs.[5,6] CHBRP estimates that approximately 4 million Californians (10%) will have insurance coverage subject to EHBs in 2021.[7]

As the bill would affect only the health insurance of Medi-Cal beneficiaries, SB 888 would not exceed the definition of EHBs in California.

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[3] The ACA requires nongrandfathered small-group and individual market health insurance — including but not limited to QHPs sold in Covered California — to cover 10 specified categories of EHBs. Policy and issue briefs on EHBs and other ACA impacts are available on the CHBRP website: www.chbrp.org/other_publications/index.php.
[4] Although many provisions of the ACA have been codified in California law, the ACA was established by the federal government, and therefore, CHBRP generally discusses the ACA as a federal law.
[5] CCIIO, Information on Essential Health Benefits (EHB) Benchmark Plans. Available at: https://www.cms.gov/cciio/resources/data-resources/ehb.html.
[6] H&SC Section 1367.005; IC Section 10112.27.
[7] CHBRP, *Estimates of Sources of Health Insurance in California in 2021*. Available at: www.chbrp.org/other_publications/index.php.

At the time of this CHBRP analysis, there is substantial uncertainty regarding the impact of the COVID-19 pandemic on premium rates and health plan enrollment, including how the pandemic will impact health care costs in 2021. Because the variance of potential outcomes is significant, CHBRP does not take these effects into account as any projections at this point would be speculative, subject to federal and state decisions and guidance currently being developed and released. In addition, insurers', providers', and consumers' responses are uncertain and rapidly evolving to the public health emergency and market dynamics.

BACKGROUND ON SUBSTANCE USE DISORDERS AND TREATMENT

SB 888 would, when funding allows, requires Medi-Cal to cover contingency management (CM) programs as part of substance use disorder (SUD) treatment. CM is a type of behavioral therapy in which individuals are "reinforced," or rewarded, for evidence of positive behavioral change such as abstinence from substance use, attendance at treatment sessions, or utilization of medication (Petry, 2011). CM is generally used as an adjunct to standard psychological and pharmaceutical interventions to treat SUD. This section provides an overview of SUDs, treatment options including CM, and SUD-related mortality rates, and health care services use.

Substance Use Disorder (SUD)

Substance use disorder is the clinical diagnosis for substance use that meets criteria per the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), including impaired control, social impairment, risky use, increased tolerance, and withdrawal symptoms (APA, 2013). The American Society of Addiction Medicine (ASAM) characterizes addiction as "the inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one's behaviors and interpersonal relationships, and a dysfunctional emotional response." SUD is a chronic condition, with both environmental and genetic influences (NIDA, 2005). Like other chronic diseases, addiction often involves cycles of relapse and remission, can vary in severity, and often requires ongoing professional treatment, lifestyle changes, and case management (ASAM, 2011; Goodwin, 2014). As with other chronic conditions, SUDs may go into remission, though they have no cure, and are characterized by relapses requiring longitudinal, long-term care (Saitz, 2008). Patients typically require multiple episodes of treatment over several years in order to achieve and sustain long-term abstinence (Dennis, 2007).

There are a number of licit and illicit substances that qualify for an SUD diagnosis including opioids (heroin and misuse of prescription pain medications such as fentanyl and oxycodone), alcohol, cannabis, nicotine, inhalants, hallucinogens, stimulants (amphetamine, methamphetamine, cocaine), and sedatives disorder. There are five substances that are most often the subject of SUD CM programs (opioids, stimulants, marijuana [cannabis], alcohol, and tobacco), which are discussed in this report and are described below (Davis et al., 2016; Prendergast et al., 2006).

- **Opioid use disorder:** Opioids are a class of drugs that include prescription pain relievers, synthetic opioids such as fentanyl, and the street drug, heroin. In 2017, the U.S. Surgeon General declared the opioid crisis a U.S. public health emergency due to the escalating rates of opioid overdose, and related mortality and other harms (HHS, 2018). In addition to a greater risk of mortality, people with opioid use disorder are at a higher risk for developing cardiac dysrhythmias, respiratory depression, and impairment in daily function (Blanco et al., 2013).

- **Stimulant use disorder:** Stimulants are a class of drugs that includes prescription medications to treat ADHD as well as illicit drugs such as cocaine and methamphetamine. Use of prescription stimulants, such as those used to treat ADHD, has substantially increased in the United States (Weyandt et al., 2016), with use doubling between 2006 and 2016 (Piper at al., 2016). Repeated misuse of stimulants can lead to psychological consequences, such as hostility, paranoia, psychosis, as well as physical consequences of high body temperatures, irregular heartbeats, and the potential for cardiovascular failure or seizures (NIDA, 2018c).

- **Cannabis use disorder:** Cannabis, also known as marijuana, is the most commonly used psychoactive drug in the United States, after alcohol (NIDA, 2019). Acute effects of cannabis use include nausea, vomiting, and abdominal pain, while chronic impacts include cognitive impairment, pulmonary disease, and sleep disturbance. To date, 33 U.S. states have medical marijuana laws and, of these, 11 states have recreational marijuana laws.

- **Alcohol use disorder:** Alcohol use disorder is the third leading cause of preventable mortality in the United States. Excessive alcohol use increases the risk of developing serious acute and chronic health problems, including but not limited to brain damage (including dementia), liver disease, heart disease, immunosuppression and infections, hypertension, cancers, depression, pancreatitis, fetal alcohol syndrome, and traumatic injuries or deaths from falls, car accidents, physical altercations, suicide, and homicide (NIAAA, 2018).

- **Tobacco use disorder:** Tobacco is the name of a class of plants that contains the addictive substance nicotine. Public health campaigns, smoking policy changes (tobacco taxation, sales restrictions, workplace restrictions, etc.), and the ACA requirement for coverage of cessation therapies by many plans and policies have contributed to California having the second lowest rate of adult smoking in the United States. There is a robust body of literature demonstrating poor health outcomes associated with smoking, including cardiopulmonary disease, cancer, dental disease, and poor fetal outcomes (e.g., low birth weight, stillbirth, preterm delivery).

Prevalence of SUDs

The DSM-5 characterizes opioid use disorder as a pattern of opioid use (e.g., oxycodone, hydrocodone, and heroin) that results in significant impairment or distress. People meeting at least two of 11 specified criteria within a 12-month period are diagnosed with mild, moderate, or severe opioid use disorder depending on the number of criteria met (APA, 2013). The same criteria are used to characterize stimulant use disorder (e.g., amphetamine-type substances, cocaine, or other stimulants, except caffeine or nicotine), cannabis use disorder (i.e., marijuana), alcohol use disorder (e.g., wine, beer, and spirits), and tobacco use disorder (e.g., smoking, chewing).

CHBRP reports the most recent data available and cites national data when California data are unavailable. In this report, misuse/abuse/dependence (or heavy drinking) rates are used as proxy measures when data on use disorders is unavailable. Data sources and prevalence rates in California vary among the five use disorders:

- 8.12% of California adults report having a substance use disorder in the past year (SAMHSA, 2019b).
- Opioid use disorder prevalence in California is 2% among people aged 12 years and older (Clemans-Cope et al., 2019).
    - Heroin use in the past year is reported among 0.20% of California adults (SAMHSA, 2019b).
    - Pain reliever misuse in the past year is reported among 3.87% of California adults (SAMHSA, 2019b).
- Stimulant use disorder prevalence in the United States is as follows:
    - Prescription stimulant use disorder: 0.2% among people aged 12 years and older (SAMHSA, 2019a);
    - Methamphetamine use disorder: 0.4% among people aged 12 years and older (SAMHSA, 2019a); and
    - Cocaine use disorder: 0.4% among people aged 12 years and older (SAMHSA, 2019a).
- Cannabis use disorder prevalence in the United States is 3.58% among people aged 12 years and older (Hasin et al., 2017). Research suggests that 9% of adults who use cannabis will become dependent, and this increases to 17% in individuals who initiate cannabis use during youth (NIDA, 2019).
- 26.5% of California adults report binge drinking one or more times in the past month, with 6.3% of the population reporting alcohol use disorder (SAMHSA, 2019b).

- Tobacco use disorder prevalence in California is 11.2% among adults (based on all tobacco products) (CDC, 2019). While this percentage is lower than the majority of states, California still has the largest number of smokers due to the size of its population (3.2 million adult smokers) (CDPH, 2018).

Of note, polysubstance use is common among those diagnosed with SUD, and many patients have more than one SUD. For example, in the United States, among those reporting alcohol use disorder, 23.8% also report nicotine dependence, and 3.9% report a concomitant prescription opioid use disorder. Among those reporting a prescription opioid use disorder, 35.2% also reported alcohol use disorder and 45.4% reported concomitant nicotine dependence (NIDA, 2018b). The diagnosis and treatment of multiple use disorders is complex and treatment and recovery rates for each SUD may vary for a single patient. It is possible for a patient to be in recovery from one SUD, but not another.

Treatment for SUD

Treatments for SUD include residential, inpatient, and outpatient care using behavioral therapy, counseling, and/or prescription medication. Mutual help groups (e.g., Alcoholics Anonymous, Narcotics Anonymous) also support those with SUD to quit substance use and maintain sobriety. CM is used as an adjunct to typical treatments for SUD and is described in detail below.

SUD Treatment and Relapse Rates

Many providers consider SUDs to be chronic conditions. As with most chronic conditions, medication adherence and long-term control of the condition (relapse prevention) are challenging. Health care professionals note that relapse is common during the recovery process for many patients with approximately 40% to 60% of patients returning to alcohol or drug use within one year of treatment and when relapse occurs it is important for patients to work with their provider to resume or modify the treatment plan (McLellan et al., 2000; NIDA, 2017). Treatment for each of the five specific SUDs are presented below.

Treatment options for opioid use disorders typically include a detoxification process in a medical facility, and the use of opioid substitution therapies that involve administration of medications to combat the negative effects of withdrawal and cravings without producing euphoric effects (Amato et al., 2011; Brady et al., 2016). The two most common medications used in substitution therapies are buprenorphine and methadone, with methadone maintenance therapy used on approximately one-quarter of individuals receiving treatment (Brady et al., 2016). A third medication sometimes used to treat opioid use disorder, Naltrexone, requires full detoxification, thus initiating treatment among active users is more difficult with this medication (NIDA, 2016). In order to prescribe buprenorphine, federal law requires health care providers to receive special training and certification called a DATA 2000 Waiver. Providers (physicians, physician assistants, and nurse practitioners) can treat no more than 30 simultaneous patients during first year of waiver, and must reapply to increase to 100 patients. Addiction medicine physicians may treat up to 275 patients at a time (SAMHSA, 2018). In 2018, there were 5,821 physicians waivered to prescribe buprenorphine in California (CHCF, 2018). Relapse rates for opioid use disorder are estimated to be as high as 72% to 88% at 12 to 36 months after detoxification (Chalana et al., 2016).

In California, stimulants (including methamphetamine and other amphetamines) were the third highest primary drug of choice reported for treatment admissions among people aged 12 years and older in 2016, followed by cocaine (SAMHSA, 2018). Currently, there are no FDA-approved medications to treat stimulant use disorders. Standard care instead includes psychosocial interventions, including cognitive behavioral therapy (CBT), self-help group therapy based on the 12-step program, or CM programs (De Crescenzo et al., 2018).The rate of individuals seeking treatment for stimulant use disorders is generally low, with potential barriers including lack of availability of treatment, embarrassment or stigma associated with disorder, and perception of interventions for treatment as ineffective (UNODC, 2019). Changes in brain function from high use of stimulants may also lead to an inability to control or stop stimulant use and

increase risk of relapse (UNODC, 2019; CSAT, 1999). In a review of prospective studies examining remission from SUD in the United States, results showed the highest remission rate among those using amphetamine (0.45) (Calabria et al., 2010). Additionally, approximately 24% of people relapse back to weekly cocaine use and 61% of individuals using methamphetamine relapse within a year following treatment (Brect and Herbeck, 2014; Sinha, 2007).

Typically, those seeking treatment for cannabis use disorders are adults who have used marijuana nearly every day for more than 10 years and have attempted to quit more than six times (NIDA, 2019). Individuals with cannabis use disorders, particularly adolescents, may also experience co-morbidities of psychiatric disorders or other SUDs. The following behavioral treatments have been used to reduce marijuana use: CBT, CM, and motivational enhancement therapy. To date, the FDA has not approved a medication for the treatment of cannabis use disorder (NIDA, 2019). Relapse rates are estimated at approximately 7%. Increased time in remission decreased the odds of relapse, whereas history of psychiatric disorders increased the odds of relapse (Flórez-Salamanca et al., 2013).

Currently, there is a variety of treatment methods available for treatment of alcohol use disorder. These options include: behavioral treatments (e.g., CBT, motivational enhancement therapy, marital and family counseling); medications (e.g., Naltrexone, Acamprosate, Disulfiram); and mutual-support groups (e.g., Alcoholics Anonymous [AA], other 12-step programs) (NIAAA, 2014). In addition, public health policies (e.g., restrictions on advertising, taxation) and brief intervention programs (e.g., social norms interventions) may also have the potential to reduce prevalence of alcohol use disorder and alcohol-related harms (Witkiewitz et al., 2019). An estimated one-third of people with alcohol use disorder receive treatment (medication and/or counseling); fewer than 10% of these use medication to treat their disorder (Jonas et al., 2014; NIAAA, 2018). Generally, alcohol use disorder is treated in specialty facilities, or patients choose to attempt abstinence through mutual-help organizations such as AA. Alcohol use disorder is treated less commonly through primary care (Jonas et al., 2014).

Effective treatments for tobacco cessation include behavioral therapies; telephone-based support and quitlines; text-message, print, and/or web-based cessation interventions; and FDA-approved medications (NIDA, 2020). FDA-approved pharmacotherapies include various forms of nicotine replacement therapy, as well as bupropion and varenicline. Prior research has shown that former smokers recalled an average of 4.7 quit attempts before successfully abstaining (CDPH, 2018). This number is likely an undercount; Chaiton et al. found that quit attempt estimates may be low because chronic smokers who attempt to quit several times rely on their memory for the number of quit attempts and tend to undercount them (Chaiton et al., 2016).

Contingency Management

CM is a type of behavioral therapy in which individuals are “reinforced,” or rewarded, for evidence of positive behavioral change (Petry, 2011). Based on principals of behavioral analysis, CM has been assessed in the context of substance use treatments, and typically consists of monetary-based rewards or vouchers to reinforce abstinence from the target drug and to promote medication compliance and treatment attendance (Petry, 2011). CM has been utilized as part of treatment for SUDs, including stimulants, opioids, marijuana, alcohol, and tobacco and typically is included as an adjunct to a specific SUD treatment such as CBT, MAT, and community reinforcement approach.

Behaviors to modify

The goal of CM is to modify behavior related to drug use. The target of individual CM programs vary and often vary by SUD. Common CM goals include drug abstinence, treatment attendance, and/or medication compliance. As noted by Prendergrast et al. (2006), the duration of the behavior modification also varies.

Drug abstinence: Abstinence from the target drug is typically measured 2 to 3 times a week through collection of urine samples in order to capture all potential drug use within that week (Petry and Stitzer, 2002). Analysis of the urine sample is conducted either on-site through a purchased on-site test kit or

sent out to an outside lab for analysis. The results from the on-site test kit can be ready within 2 to 5 minutes, whereas results from an outside lab can take between 3 and 5 days. It is preferred to conduct the analysis on site to ensure provision of immediate rewards for drug abstinence.

Treatment attendance: CM can also be employed to increase attendance and participation in substance use treatment. Substance use treatment clinics typically have attrition rates of 80% or higher, particularly among outpatient mental health treatment centers. Through utilizing reinforcers or rewards that are contingent on attendance, attendance rates may improve across a variety of treatment settings (Petry, 2012).

Medication compliance: The treatment of some SUDs (alcohol, opioids, and tobacco) includes FDA-approved medications. CM can target adherence to a medication regime to improve compliance through rewards for directly supervised ingestion of medications (Petry, 2012). For example, medication compliance could be assessed by direct supervision of the patient taking their medicine or through remote monitoring using devices that monitor the extent to which prescription bottle caps are opened and closed (Petry, 2012).

Structure of incentive

CM programs can vary in terms of how the incentive is structured and can use incentives in the form of vouchers, prizes, or cash. The vouchers have monetary value and can accumulate in a clinic-managed account as the patient remains drug-free. Instead of providing money directly to patients, program or clinic staff can use the earned amount in vouchers to purchase items requested by the patient that are reasonable and consistent with positive lifestyle change (e.g., no weapons, cigarettes) (Petry and Stitzer, 2002). Typically, patients purchase clothing, electronic equipment, sporting/hobby items, and recreational items with their vouchers. Items can also be stored in a space that CM studies refer to as a “prize cabinet” (Petry and Stitzer, 2002). The prize cabinet provides patients the opportunity to identify tangible prizes that may motivate them to continue treatment. The prize cabinet can consist of items ranging in value, from jumbo value (e.g., televisions, small appliances) to large or medium prizes (e.g., clothing store gift certificates, jewelry, decorative items) to small prizes (e.g., candy, toiletries) (Petry and Stitzer, 2002). Typically, patients in the incentive programs earn at least one voucher for each urine sample that tests negative for the target drug. The escalating schedule is a component of the CM incentive structure that can help encourage long periods of abstinence through escalating vouchers or rewards for increasing periods of abstinence (Petry and Stitzer, 2002).

Structural and Attitudinal Barriers to Substance Use Disorder Treatment

Barriers to accessing treatment for SUDs, including treatment using CM, include provider- and patient-level factors. These barriers are described in more detail below.

Provider-Related Barriers

Provider supply including provider attitudes and geographic access can also pose structural barriers to SUD treatment. Lack of available providers to treat SUDs in a specific geographic region, and more specifically a lack of providers who have been trained to administer CM as part of SUD treatment, will limit the extent to which patients can access treatment. In addition, for CM that targets treatment with medication, significant prescribing restrictions limit access to medications to treat SUDs, and limit provider participation. Patients may also face supply issues or geographical barriers to accessing SUD treatment using CM. A provider office would need to have the ability to monitor abstinence through urine testing and have medications used to treat SUD in office as well as the administrative capacity to administer the program. Provider willingness to treat SUDs using CM can also be limited; not all providers are comfortable offering CM programs due to a lack of training, lack of office space and support resources, time pressure, or personal beliefs against using incentives to treat SUDs (HHS, 2018; McNeely et al., 2018).

Patient-Related Barriers

For many patients with SUD, attitudinal barriers are the most significant barrier to treatment initiation and persistence (Blanco et al., 2013). The stigma of addiction and the ability to acknowledge an SUD affects patient desire to seek care; even more so for those who have co-occurring psychiatric conditions (Fisher et al., 2016; Jones et al., 2015; Verissimo and Grella, 2017). Many people with SUD believe they can solve the problem themselves (Rapp et al., 2006). Rapp et al. (2006) tested a Barrier to Treatment Inventory tool to assess perceived barriers to treatment for those with SUDs. They reported significant correlation among six of the seven barrier factors: absence of a problem; negative social support; fear of treatment; privacy concerns; time conflict; poor treatment availability; and admission difficulty. Another barrier for patients participating in treatment specifically using CM, is the requirement to travel to the provider's office, sometimes up to 2 to 3 times a week. This can cause more of a burden for patients who do not have flexible schedules and those who are living in areas with a shortage of providers who treat SUDs and a lack of access to providers that are administering CM programs.

SUDs in California: Mortality and Health Services Use

SUD-Related Mortality

SUDs result in significant mortality in California. Tobacco use is the leading cause of preventable illness and death in the United States and California. The CDC estimates that smoking and exposure to tobacco smoke account for approximately 40,000 deaths annually in California. It is also estimated that there are nearly 16,000 deaths due to illicit substances each year, with approximately 2,196 deaths from opioid use disorder, 3,035 deaths from stimulant use disorder, and 10,671 alcohol-attributed deaths from both chronic and acute causes (CDC, 2013; CDPH, 2018; CDPH, 2019). The pattern seen in California and other western states, where stimulants such as methamphetamine are the leading cause of overdose deaths, is significantly different from the pattern seen in eastern states where opioids such as fentanyl are the leading cause of overdose deaths (Hedegaard et al., 2019). For example, in Region 9 (California, Arizona, and Nevada), the leading cause of death from overdose was methamphetamine (5.2 per 100,000), followed by heroin (2.2 per 100,000), fentanyl (1.5 per 100,000), and cocaine (1.3 per 100,000) (Hedegaard et al., 2019). Across the United States the leading cause of overdose death is fentanyl (8.7 per 100,000), followed by heroin (5.0 per 100,000), cocaine (4.6 per 100,000), and methamphetamine (2.9 per 100,000) (Hedegaard et al., 2019). It is unclear how cannabis use disorder is associated with mortality (National Academies of Science, Engineering, and Medicine; 2017). Chronic use of cannabis has been linked to psychological and physical health consequences, including increased risk for psychiatric disorders (e.g., psychosis, depression, anxiety, and other SUDs), decline in cognitive function, impairment in learning and coordination, reduced educational and workplace outcomes, and lung inflammation/chronic bronchitis (NIDA, 2019). It is not clear to what extent cannabis use increases the risk of mortality related to these health consequences.

SUD-Related Health Services Use

Alcohol misuse in California led to approximately 119,600 nonfatal emergency room visits and 30,000 nonfatal hospitalizations for alcohol-related injuries and poisonings each year. In addition, the California Opioid Overdose Surveillance Dashboard provides a variety of statistics about California's experience with opioid, stimulant, and cannabis misuse, including information about emergency department (ED) use and hospitalizations. They found that 8,832 Californians (24 per 100,000) were seen in EDs and 3,672 (8 per 100,000) were hospitalized for opioid overdose in 2017 (CDPH, 2019). Additionally, 1,954 (5/100,000) Californians were seen in EDs for amphetamine overdose (CDPH, 2019) and 536 (1/100,000) Californians were seen in EDs for cocaine overdose (CDPH, 2019). Finally, the dashboard estimated 2,782 (7/100,000) Californians were seen in EDs and 543 (1/100,000) were hospitalized for cannabis related issues (CDPH, 2019).

Disparities[8] and Social Determinants of Health[9] in Substance Use Disorders

Per statute, CHBRP includes discussion of disparities and social determinants of health (SDoH) as it relates to the SUDs. Disparities are differences between groups that are modifiable, and insurance benefit mandates that impose coverage parity among state-regulated plans and policies may change an existing disparity.[27] SDoH include factors outside of the traditional medical care system that influence health status and health outcomes (e.g., income, education, geography).

Disparities occur within many demographic categories in California such as race/ethnicity, gender, and age. Disparities in opioid overdose mortality rates, hospitalizations, and emergency department use exist among racial/ethnic groups (highest among whites and Native Americans); age cohorts (highest among those aged 25–35); and by gender (males have two times the mortality rate of females) (CDPH, 2019). The LGBT population is twice as likely as the heterosexual population to report misusing prescription opioids (NIDA, 2017). In addition, alcohol use disorder–related disparities among racial/ethnic groups exist in California with whites and Native Americans exhibiting the highest rates of heavy drinking, although Hispanics and blacks have higher rates of alcohol-related liver disease and cirrhosis mortality (NIAAA, 2019). Similar to other SUDs, younger cohorts (aged 18–34 years) report higher rates of heavy drinking as compared with other ages; similarly, the LGBT population reported higher rates of binge drinking than the heterosexual population (Ward et al., 2014).

Taken as a whole, treatment of SUDs is inextricably linked bi-directionally with many important social determinants of health. SDoH such as quality of built environment, proximity to crime, educational opportunities, self-efficacy, and income levels can influence a person's risk for SUDs (Mooney at al., 2018; Sudhinaraset et al., 2016). Conversely, SUDs can also alter a person's baseline SDoH namely through the consequences of addiction, such as involvement with the criminal justice system, job loss, unstable housing or family situations, and discrimination against those with treated or untreated SUDs (Krebs et al., 2016).

[8] Several competing definitions of "health disparities" exist. CHBRP relies on the following definition: Health disparity is defined as the differences, whether unjust or not, in health status or outcomes within a population. (Wyatt et al., 2016).

[9] CHBRP defines social determinants of health as conditions in which people are born, grow, live, work, learn, and age. These social determinants of health (economic factors, social factors, education, physical environment) are shaped by the distribution of money, power, and resources and impacted by policy (adapted from: CDC, 2014; Healthy People 2020, 2019). See CHBRP's SDoH white paper for further information: http://chbrp.com/analysis_methodology/public_health_impact_analysis.php.

MEDICAL EFFECTIVENESS

As discussed in the *Policy Context* section, SB 888 would require Medi-Cal to cover contingency management (CM) programs as an aspect of substance use disorder (SUD) treatment. Additional information on CM and SUDs is included in the *Background on Substance Use Disorders and Treatment* section. Treatments for SUDs include residential, inpatient, and outpatient care using behavioral therapy, counseling, and/or prescription medication. CM is a type of behavioral therapy generally associated with outpatient SUD treatment in which individuals are "reinforced," or rewarded, for evidence of positive behavioral change (Petry, 2011). The reinforcement typically targets abstinence from drug use, utilization of medications to treat SUDs, or attendance at treatment meetings, and can take the form of vouchers for goods, lottery entries for cash or prizes, or direct cash payments. Evidence indicates that CM has been utilized in treating SUDs, including stimulants, opioids, cannabis, alcohol, and tobacco. The medical effectiveness review summarizes findings from this evidence[10] on the impact of CM for SUDs. Due to the timeframe and the wealth of literature, CHBRP limited its initial literature search to systematic reviews and only presents data on individual studies where the systematic reviews were not relevant to a particular SUD.

Research Approach and Methods

Studies of CM for SUDs were identified through searches of systematic reviews on PubMed, the Cochrane Library, and PsycINFO. The search was limited to abstracts of studies published in English and current through March 3, 2020. Of the 59 review articles identified, an additional eight review articles were identified through the process of reviewing articles for potential inclusion in this report on SB 888. In total, 22 studies were included in the medical effectiveness review for this report. The other articles were eliminated because they did not specifically review research related to CM or did not look at the outcomes of interest (as described below). A more thorough description of the methods used to conduct the medical effectiveness review and the process used to grade the evidence for each outcome measure is presented in Appendix B.

The conclusions below are based on the best available evidence from peer-reviewed literature.[11] Unpublished studies are not reviewed because the results of such studies, if they exist, cannot be obtained within the 60-day timeframe for CHBRP reports.

Key Questions

1. What is the effectiveness of CM for treatment of SUDs compared to usual care for SUDs for the following disorders?

    a. Opioid Use Disorder

    b. Stimulant Use (including methamphetamines) Disorder

    c. Cannabis Use Disorder

    d. Alcohol Use Disorder

[10] Much of the discussion in this section is focused on reviews of available literature. However, as noted in the section on Implementing the Hierarchy of Evidence on page 11 of the Medical Effectiveness Analysis and Research Approach document (posted at http://chbrp.com/analysis_methodology/medical_effectiveness_analysis.php), in the absence of fully applicable to the analysis peer-reviewed literature on well-designed randomized controlled trials (RCTs), CHBRP's hierarchy of evidence allows for the inclusion of other evidence.

[11] Grey literature consists of material that is not published commercially or indexed systematically in bibliographic databases. For more information on CHBRP's use of grey literature, visit http://chbrp.com/analysis_methodology/medical_effectiveness_analysis.php.

e. Tobacco Use Disorder

2. What are the harms associated with treatment using CM for SUDs?

Methodological Considerations

There is no one standard way to conduct CM for SUDs. This means that there are a range of ways to structure the reward offered for different targeted behaviors across each of the five SUDs. The CM program can vary in terms of the time duration, incentive value, and format (cash, vouchers for goods, lottery, escalating vs. constant payouts, etc.). This lack of uniformity leads to difficulty in combining results across studies. In addition, although each substance is reviewed separately in this report, polysubstance use is common among those diagnosed with SUD, and many patients have more than one SUD. The diagnosis and treatment of multiple SUDs is complex and treatment and recovery rates for each SUD may vary for a single patient. It is possible for a patient to be in recovery from one SUD, but not another. While some of the studies included in this review targeted multiple substances, CHBRP did not review each possible combination of substances separately to assess the impact of CM.

Due to the time constraints of completing this analysis, it was necessary to rely on previously published systematic reviews to identify the relevant literature on CM for treating SUDs. It is possible that there is more recent literature that is not captured using this method. This is particularly relevant for opioid use disorder, which is a more recently studied SUD, and for which there may be additional, more recent research that would impact the assessment of the medical effectiveness.

Outcomes Assessed

Studies of CM for SUDs have primarily examined outcomes related to abstinence, treatment, and medication use. All of the reviewed studies reported abstinence from targeted drugs as a primary outcome. For these studies, abstinence was measured as the longest duration of continued abstinence (measured in weeks or in consecutive draws) or as the number of negative samples tested during the study period. For studies in which participation in treatment was a primary outcome, treatment could be defined as the number of weeks continuously in treatment (i.e., showing up for counseling sessions) or the number of missed appointments in a given time period. Finally, for SUDs where medications are used as part of the treatment (i.e., opioids, alcohol, and tobacco), medication use was measured as a primary outcome for a number of studies, defined as the number of times medicine is taken in a given time period. Secondary outcomes examined included health care utilization including emergency room visits and hospitalizations. For all of these studies, outcomes were reported during treatment, at the conclusion of treatment, and/or in the months posttreatment.

Study Findings

This following section summarizes CHBRP's findings regarding the strength of evidence for the effectiveness of CM for SUDs as addressed by SB 888. Some studies' systematic reviews compared CM alone to treatment as usual while others compared CM as added to other psychosocial interventions. In these cases, CM was used for the duration of treatment and ended at the conclusion of the treatment period. Each section is accompanied by a corresponding figure. The title of the figure indicates the test, treatment, or service for which evidence is summarized. The statement in the box above the figure presents CHBRP's conclusion regarding the strength of evidence about the effect of a particular test, treatment, or service based on a specific relevant outcome and the number of studies on which CHBRP's conclusion is based. Definitions of CHBRP's grading scale terms is included in the box below, and more information is included in Appendix B.

SUD Treatment Using Contingency Management

This review identified two systematic reviews looking at CM for SUD treatment. Prendergast et al. (2006) identified 46 randomized controlled trials (RCTs) or quasi experimental studies enrolling a total of 5,067 subjects. Overall, they calculated that the standardized mean difference (d) in drug use abstinence rates either during or at the end of treatment between the treatment group (using CM) and the control group (usual care) was 0.42 — representing a 22% difference in rates of drug use between groups (Prendergast et al., 2006). Across substances, they found that CM was more effective in achieving abstinence during treatment for cocaine use (d = 0.66) and opiate use (d = 0.65) compared with tobacco use (d = 0.31) or poly drug use (d = 0.42) (Prendergast et al., 2006). Across the 46 RCTs, attrition rates ranged from 0% to 65% with an average of 20.2%. In addition, the three most frequently used types of CM were vouchers (55.3%), take home methadone doses (23.4%) and cash (21.3%) (Prendergast et al., 2006).

In addition, this review identified three systematic reviews that examined the structure of the CM program on outcomes. Davis et al. (2016) reviewed 69 studies of voucher-based CM programs enrolling a total of 2,675 people. Eighty-six percent of these studies reported positive treatment effects, with an overall standardized mean difference between CM and usual care groups of d = 0.62 (0.54–0.70). Lussier et al. (2006) also conducted a meta-analysis of 30 studies of voucher-based CM programs and found that greater effects were seen for immediate rewards compared to delayed rewards. They also found that the abstinence effect size was proportional to the size of the reward (Lussier et al., 2006). Benishek et al. (2014) reviewed 19 studies enrolling 2,581 participants in prize-based CM studies. They found that prize-based CM was effective in increasing abstinence during treatment with an average treatment effect size of d = 0.46 (0.37–0.54).

Contingency management for SUD — effects over time

In terms of the impact of CM on outcomes over time, a review of 19 studies enrolling 2,581 participants in prize-based CM studies, they found that effects seen at the end of treatment were not maintained post-intervention with effect sizes at 3 months of 0.33 (0.12–0.54) and at 6 months of -0.09 (-0.28–0.10) (Benishek et al., 2014). Similar results were found in studies of treatment of opioid use disorder (Hser et al., 2011; Ling et al., 2012) and a meta-analysis of 14 articles on CM for stimulant use disorder (De Crescenzo et al., 2018). In contrast, studies of tobacco use disorder found a significant impact of CM on abstinence at 6 months posttreatment (Notley et al., 2019).

Studies on the effect of CM for cannabis use disorder over time found conflicting results. One study found that CM in combination with cognitive behavioral therapy (CBT) and motivational enhancement therapy (MET) was more effective in achieving abstinence at 1 year posttreatment compared to CBT plus MET alone (Kaaden et al., 2007). An additional study found that there was a significant difference for CM plus CBT compared to CBT up to 9 months posttreatment, but not at 12 months (Budney et al., 2006). Studies among justice-involved individuals did not show a significant impact of CM on abstinence rates at 12 months posttreatment (Carroll et al., 2006; Carroll et al., 2012). There was no evidence that CM alone was significant in increasing abstinence rates at 12 months posttreatment.

Contingency management for opioid use disorder

Two systematic reviews were identified that addressed CM for the treatment of opioid use disorder. Timko et al. (2016) and Dugosh et al. (2016) conducted systematic reviews that identified six articles enrolling a total of 1,259 patients in RCTs (5 studies) and a prospective observational study that addressed CM for patients using medication-assisted treatment (MAT) for opioid use disorder. These six studies reported an average value of the incentive of $470 ($41–$1,460) across studies. Three of these studies addressed the use of CM in a general population of MAT users. Two of the three studies found that CM increased retention of MAT at 3 months and that the patients in the CM group provided more opioid-free urine samples (Chen et al., 2013; Hser et al., 2011; and Ling et al., 2013). Chen et al. (2013) and Hser et al. (2011) found that at 3 months, 81% of the patients in the methadone plus CM group were still in treatment compared to 67% of those in the usual care group. One study (Kidorf et al., 2013) found that CM was not

effective in increasing treatment adherence or abstinence among psychiatric patients with opioid use disorder. Another study found that CM was effective in improving adherence to MAT, but not abstinence rates for patients who were required to use MAT in order to access employment opportunities (Dunn et al., 2013). Gerra et al., found that there was no difference in abstinence rates for patients who were allowed to take home 7 days of MAT if they had a negative urine sample compared to patients who had to come in each day to receive their MAT (Gerra et al., 2011).

Summary of findings regarding CM for opioid use disorder: There is limited evidence from two systematic reviews of six studies that CM is more effective in improving abstinence rates during treatment and keeping patients retained in MAT compared to patients in usual care. There is also limited evidence that CM for opioid use disorder is not effective in improving rates of abstinence posttreatment.

Figure 1. Effectiveness of CM for Opioid Use Disorder Versus Treatment as Usual on Retention in Treatment and Abstinence During Treatment

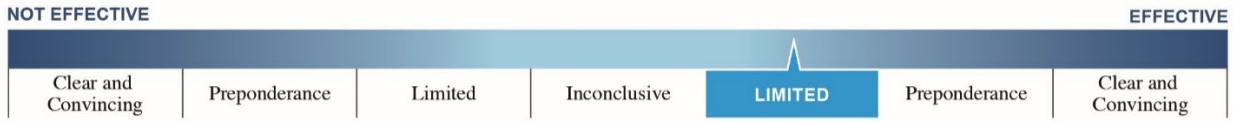
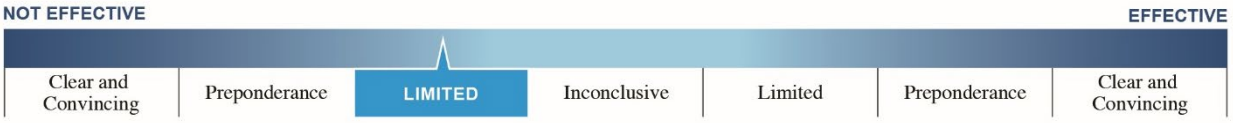


Figure 2. Effectiveness of CM for Opioid Use Disorder Versus Treatment as Usual on Abstinence at Follow-Up



Contingency management for stimulant use disorder

De Crescenzo et al. (2018) conducted a meta-analysis of 50 RCTs of psychosocial interventions to treat stimulant use disorder (cocaine and/or amphetamine) using the PRISMA guidelines. This review identified 14 articles that estimated the effect of CM compared to treatment as usual (TAU) which included a total of 1,984 participants. A meta-analysis of these studies found that treatment length averaged 11.3 weeks (range: 8–16 weeks) and CM compared to TAU had higher adjusted odds of abstinence at the end of treatment (2.22; 95% CI: 1.59–3.10) (De Crescenzo et al., 2018). In addition, they found that CM compared to TAU had higher acceptability of treatment (measured proportion of patients who dropped out due to any cause) at the end of treatment (1.41; 95% CI: 1.10–1.82) (De Crescenzo et al., 2018). There was no significant difference between CM and TAU groups in abstinence rates at the longest follow-up (OR = 1.10; 95% CI: 0.83–1.46). Of the combinations of psychosocial interventions evaluated, CM plus community reinforcement (an intervention that involves reinforcement at multiple levels such as family, social, recreational, and vocational as well as functional analysis and coping-skills training) was the only combination that had significant adjusted odds of higher abstinence at 12 weeks (OR = 7.60; 95% CI: 2.03–28.37), at the end of 24 weeks of treatment (OR = 2.84; 95% CI: 1.24–6.51), and at the longest follow-up period (average of 59.3 weeks) (OR = 3.08; 95% CI: 1.33–7.17).

Summary of findings regarding CM for stimulant use disorder: There is a preponderance of evidence from one systematic review of 14 RCTs that CM is more effective than treatment as usual with regard to abstinence during treatment and acceptability (i.e., lower treatment dropout rates). There is a preponderance of evidence that CM is not effective in improving abstinence rates posttreatment at follow-up with the exception of CM coupled with the community reinforcement approach.

Figure 3. CM for Stimulant Use Disorder Versus Treatment as Usual on Abstinence During Treatment and Treatment Retention

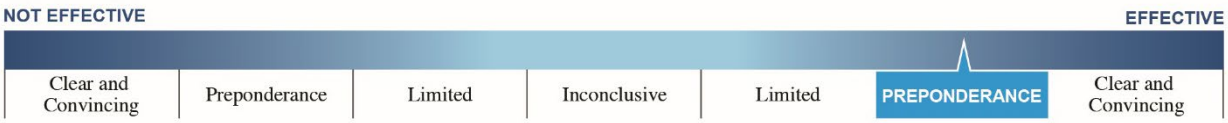
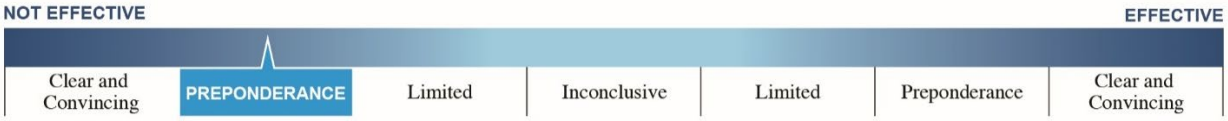


Figure 4. CM for Stimulant Use Disorder Versus Treatment as Usual on Abstinence Posttreatment at Follow-Up



Contingency management for cannabis use disorder

Three systematic reviews were identified that reported on the use of CM for treating cannabis use disorder (Cooper et al., 2015; Davis et al., 2015; Gates et al., 2016). These three reviews identified six RCTs with 868 total participants that examined the impact of CM on treatment for cannabis use disorder (Budney et al., 2000; Budney et al., 2006; Carroll et al., 2006; Carroll et al., 2012; Kadden et al., 2007; Litt et al., 2013). These six studies reported an average value of the incentive of $467 ($250–$590) across studies. In addition, five out of six studies reported that CM was effective in increasing abstinence in terms of consecutive cannabis free urine samples and total cannabis free urine samples during treatment. Only one of three studies looking at the impact of CM on treatment attendance found a statistically significant positive effect. Cooper et al. (2015) found that CM or CM plus CBT was more effective in achieving abstinence from cannabis than CBT or other behavioral therapies.

Studies on the effect of CM for cannabis use disorder over time found conflicting results. One study found that CM in combination with CBT and MET was more effective in achieving abstinence at 1 year posttreatment compared to CBT plus MET alone (Kaaden et al., 2007). An additional study found that there was a significant difference for CM plus CBT compared to CBT up to 9 months posttreatment, but not at 12 months (Budney et al., 2006). Studies among justice-involved individuals did not show a significant impact of CM on abstinence rates at 12 months posttreatment (Carroll et al., 2006; Carroll et al., 2012). There was no evidence that CM alone was significant in increasing abstinence rates at 12 months posttreatment.

Summary of findings regarding CM for cannabis use disorder: There is a preponderance of evidence from six RCTs that CM is effective in increasing abstinence from cannabis use during the treatment period, and inconclusive evidence to suggest that these results may persist in posttreatment follow-up.

Figure 5. CM for Cannabis Use Disorder Versus Treatment as Usual on Abstinence During Treatment

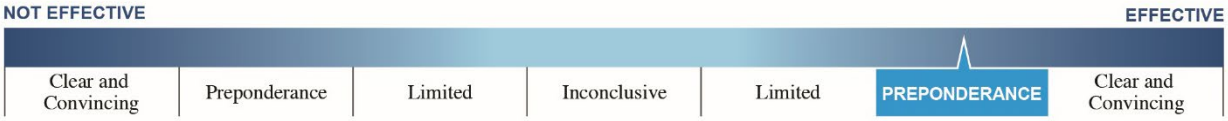


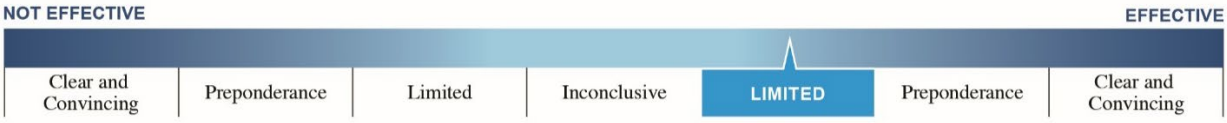
Figure 6. CM for Cannabis Use Disorder Versus Treatment as Usual on Abstinence at Posttreatment Follow-Up

Contingency management for alcohol use disorder

Gao et al. (2018) conducted a systematic review of 137 RCTs of interventions for alcohol use disorder. Of these, 11 trials enrolling 885 participants compared CM plus psychotherapy to psychotherapy alone. This meta-analysis found that CM plus psychotherapy was more effective than psychotherapy alone in six of the 11 studies for an overall adjusted odds ratio of abstinence measured during treatment sessions of 2.191 (95% CI: 1.29–3.72). The largest of these 11 studies was conducted by Hagedorn et al. (2013). This study enrolled 191 patients in the VA in a CM trial. This study found that compared to usual care, the CM group was more likely to submit an alcohol negative urine sample (82.3% vs. 67%), to have a longer period of continuous abstinence (7.16 weeks vs. 6.22 weeks), and to complete more SUD treatment visits (16 vs. 9) (Hagedorn et al., 2013).

Summary of findings regarding CM for alcohol use disorder: There is limited evidence from one systematic review of 11 low to moderate quality RCTs that CM is more effective than treatment as usual with regard to abstinence during treatment.

Figure 7. CM for Alcohol Use Disorder Versus Treatment as Usual on Abstinence Rates During Treatment



Contingency management for tobacco use disorder

Notley et al. (2019) conducted a Cochrane systematic review of CM for patients with tobacco use disorder (33 studies; 21,600 participants). The primary outcome examined in this systematic review was posttreatment (following months) smoking cessation. This was defined in a variety of ways and included both point prevalence and continuous abstinence at a minimum of six months. Abstinence was reported as biochemically validated at an in-person visit. They found that there was a significant difference in quitting tobacco use at six months between those offered incentives and those not offered incentives (risk ratio [RR] = 1.49; 95% CI: 1.28–1.73). The incentives ranged from zero (patients gave a deposit that was at risk) to between $45 and $1185. There was no clear effect of the size of the incentive on the cessation outcomes. Notley et al. (2019) also distinguished between studies of the general population and pregnant women (10 studies; 2571 pregnant women). The studies of pregnant women found that the use of incentives resulted in an increase in cessation at 24 weeks postpartum of 2.38 (95% CI: 1.54–3.69).

Anderson et al. (2018) published a study on CM for tobacco use cessation among Medi-Cal enrollees in California in December, 2018 that was published after Notley et al. (2019) conducted their systematic review. This study is relevant in that it is the population targeted by SB 888 (Medi-Cal enrollees), and utilizes the California Smokers' Helpline (Helpline), a toll-free counseling quit line conducted in multiple languages to help Californians quit smoking. As the California Department of Health Care Services requires coordination between Medicaid managed care plans and the Helpline to address tobacco use, the Helpline has become a key component of tobacco cessation programs in Medi-Cal managed care

plans in California (DHCS, 2016). Medicaid enrollees who called the Helpline were randomized into one of three trial arms: usual care, receipt of nicotine patch, and patch plus CM. The CM group was paid for each call they made to the Helpline for cessation counseling. They found that the CM plus patch group had higher rates of abstinence at 6 months (13.2%) compared to the patch (10.3%) or usual care group (9.0%) (p-values = 0.02 and 0.017). In addition, they found that the patch plus CM group had a higher number of calls to the Helpline (6.2, 95% CI: 5.9–6.4) compared to the patch group (5.1, 95% CI: 4.8–5.3) or the usual care group (5.0, 95% 4.6–5.2).

Summary of findings regarding CM for tobacco use disorder: There is clear and convincing evidence from one systematic review of 33 RCTs that CM is more effective than treatment as usual in reducing rates of tobacco use during treatment and at 6 months. In addition, there is clear and convincing evidence from 10 RCTs of pregnant women who smoke, that CM is more effective than treatment as usual in reducing rates of tobacco use at 6 months.

Figure 8. Effectiveness of CM for Tobacco Use Disorder Versus Treatment as Usual on Abstinence During Treatment

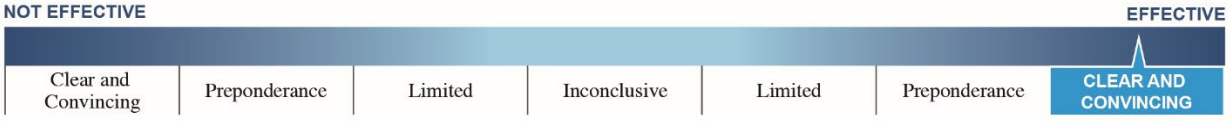
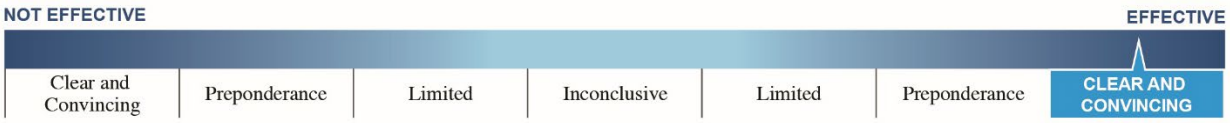


Figure 9. Effectiveness of CM for Tobacco Use Disorder Versus Treatment as Usual on Abstinence Rates at 6 Months

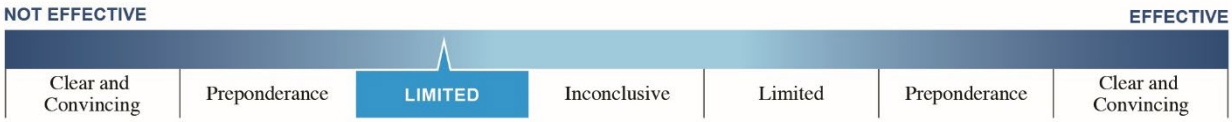


Impact of Contingency Management on Health Care Utilization

Secondary outcomes assessed by this literature review included the impact of CM on health care utilization such as emergency department visits and hospitalizations. A review by Olmstead et al. (2012) identified five RCTs enrolling 1,028 people that reported on impacts on health care utilization related to treating cocaine, heroin, and alcohol use disorders with and without CM. While they found that over the study period, there was an increase in office visits and outpatient mental health visits and a decrease in hospitalization for mental health problems, there was no detected difference in the rates of change between the CM group compared to the standard care group (Olmstead et al., 2012). This led the study authors to conclude that there was no evidence of a change in health care utilization due to CM for SUDs in the long-term.

Summary of findings regarding impact of CM on health care utilization: There is limited evidence from one systematic review of five RCTs that CM is not effective in impacting health care utilization associated with outcomes related to treatment for SUDs.

Figure 10. Effectiveness of CM for SUDs Versus Treatment as Usual on Health Care Utilization

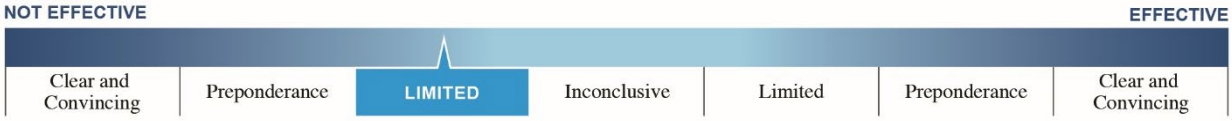


Polydrug Use

Polysubstance use is common among those diagnosed with SUD, and many patients have more than one SUD. The diagnosis and treatment of multiple use disorders is complex and treatment and recovery rates for each SUD may vary for a single patient. It is possible for a patient to be in recovery from one SUD, but not another. Griffith et al. (2000) conducted a review that evaluated the impact of CM on drug use among patients in an outpatient methadone treatment program. This meta-analysis of 30 studies included a total sample size of 1,568. An examination of the type of drug use targeted (opiates, cocaine, benzodiazepines) found that CM programs targeting a single drug had larger effect sizes than those targeting polydrug use (Griffith et al., 2000).

Summary of findings regarding CM for polydrug use: There is limited evidence that CM is not effective in treating multiple SUDs at a time

Figure 11. Effectiveness of CM for SUDs in Treating Polydrug Use

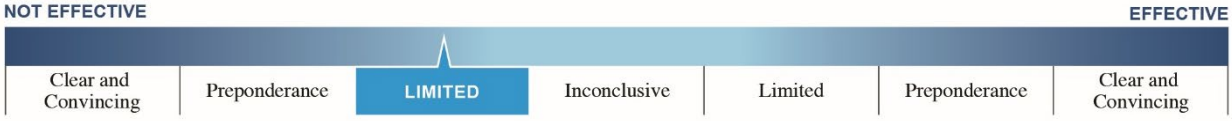


Serious Mental Illness

More than half of people with serious mental illness also have an SUD (Hunt et al., 2014). Two studies were identified that examined the impact of CM on SUD among patients with serious mental illnesses (Cleary et al., 2009; Hunt et al., 2014). Hunt et al. (2014) identified two RCTs that examined the impact of CM for SUDs among patients with serious mental illness. Both RCTs found that CM was no different than treatment as usual in terms of retention in treatment or hospitalizations. An additional three RCTs were identified in the review by Clearly et al. (2009). This review also concluded that there was no difference in rates of abstinence at 6 months (Clearly et al., 2009).

Summary of findings regarding CM for SUD among patients with serious mental illness: There is limited evidence that CM is not effective in treating SUDs for persons with serious mental illness.

Figure 12. Effectiveness of CM for SUDs Versus Treatment as Usual for Persons with Serious Mental Illness

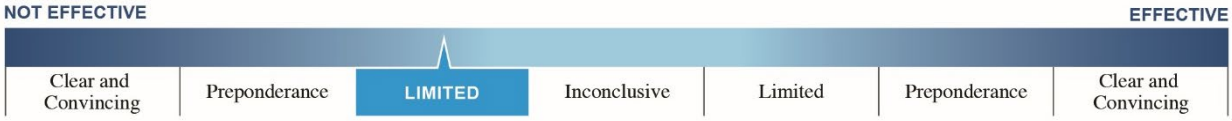


Harms Related to Contingency Management

Two potential harms from CM that have been explored in the literature are (1) the use of incentives reducing internal motivation to change and (2) incentives being sold or exchanged to purchase additional drugs, alcohol, or tobacco (Petry, 2010). One RCT addressed the question of incentives reducing internal motivation to change using 115 patients in community clinics for SUD treatment. They found that those randomized to receive CM did not have any reduced motivation to change (as measured by the University of Rhode Island Stages of Change Model) compared to those randomized to usual care (Ledgerwood and Petry, 2006). In addition, three studies have examined if CM leads to increased drug use (outside of the target drug) due to selling or exchanging the voucher for drugs (Festinger et al., 2005; Kadden et al., 2009; Petry et al, 2000). These three studies all found no evidence of an increase in ancillary drug use as a result of CM. Therefore, there is limited evidence to suggest that CM does not lead to an increase in harms such as reduction in motivation and increase in ancillary drug use.

Summary of findings related to harms of CM for the treatment of SUDs: There is limited evidence from four studies that CM is not associated with an increase in harms related to treatment for SUDs.

Figure 13. Harms Related to CM for the Treatment of SUDs



Summary of Findings

Table 1 summarizes evidence of the effectiveness of CM for the treatment of SUD. Evidence is reported separately, where available, for CM by (1) substance (opioid, stimulants, cannabis, alcohol, tobacco) and (2) CM type (voucher vs. prize-based). The literature review found that there is the strongest evidence for using CM for tobacco use dependence where there is clear and convincing evidence that CM improves abstinence during treatment both nonpregnant and pregnant patients. There is a preponderance of evidence that CM is effective in the improving abstinence rats during treatment for stimulant and cannabis use disorder. There is limited evidence that treatment for opioid use disorder and alcohol use disorder are effective at improving abstinence rates during treatment. In addition, there is a preponderance of evidence that treatment effects do not persist at longer follow-up periods, except for tobacco use disorder where there is clear and convincing evidence that CM improves abstinence 6 months posttreatment for both nonpregnant and pregnant patients.

Table 1. Summary of Evidence of Medical Effectiveness of Test/Treatment/Service

Type of SUD	Type of CM	Outcomes	Effectiveness of CM
Multiple	Voucher-based	Abstinence during treatment	Preponderance of evidence that voucher-based CM is effective at increasing abstinence rates during treatment across a variety of substances.
Multiple	Prize-based	Abstinence during treatment	Preponderance of evidence that Prized-based CM is effective at increasing abstinence rates during treatment across a variety of substances.
Opioid	Multiple*	Abstinence during treatment	Limited evidence from two systematic reviews of 35 RCTs that CM is more effective in improving abstinence rates

		Treatment retention	during treatment and keeping patients retained in MAT compared to patients in usual care.
Stimulants	Multiple*	Abstinence during treatment	Preponderance of evidence that CM is effective at increasing abstinence rates during treatment.
		Posttreatment abstinence	Preponderance of evidence that CM is **not** more effective at increasing post treatment (months) abstinence.
		Treatment retention	Preponderance of evidence that CM improves treatment retention.
Cannabis	Voucher/prize drawings	Abstinence during treatment	Preponderance of evidence from 6 RCTs that CM is effective in increasing during treatment abstinence.
		Posttreatment Abstinence	Inconclusive evidence that CM increases posttreatment (months) abstinence.
Alcohol	Multiple*	Abstinence during treatment	Limited evidence that CM is effective at increasing abstinence during treatment (OR = 2.191; 95% CI: 1.290–3.720)
Tobacco	Multiple*	Posttreatment abstinence	Clear and convincing evidence that CM is effective at increasing abstinence during treatment and at 6 months for tobacco use disorder for both pregnant and non-pregnant tobacco-users.

Source: California Health Benefits Review Program, 2020.

Notes: *Studies included voucher-based, prize-based, and/or other forms of CM.

Key: CBT = cognitive behavioral therapy; CI = confidence interval, d = mean difference in treatment and control groups, OR = odds ratio, RR = risk ratio, TAU = treatment as usual, TUD = tobacco use disorder.

BENEFIT COVERAGE, UTILIZATION, AND COST IMPACTS

As discussed in the *Policy Context* section, SB 888 would allow expansion of Medi-Cal substance use disorder (SUD) treatment programs to include contingency management (CM) services under certain circumstances.

As discussed in the *Background on Substance Use Disorders and Treatment* section, CM programs related to SUD treatment generally involve giving patients tangible rewards such as prizes, cash, or vouchers to reinforce goal behaviors, such as abstinence, medication adherence, or greater/continued engagement with treatment. SUD services such as counseling are already a Medi-Cal covered benefit. CM is intended as a way to improve the outcomes of these services. CM is not a benefit that directly covers a health care screening, treatment, service, or item. Rather it is an incentive, analogous to, for example, incentive payments for members participating in wellness programs to encourage healthy behaviors.

SB 888 does not specify how the Department of Health Care Services (DHCS) should implement CM for SUDs. Therefore, in this section, CHBRP presents the incremental cost for implementing CM services for 1,000 beneficiaries engaged in SUD treatment under two hypothetical programs for methamphetamine and tobacco use disorders. Implementation of CM in Medi-Cal could involve large numbers of beneficiaries, but as the number of participants is unknown, CHBRP has presented a limited analysis that could potentially be scaled up, as funding permits. The cost of the scaling up a program would be linear (twice as many participants would cost twice as much) although some administrative savings may be realized.

CHBRP has modeled CM as an addition to outpatient treatment for two SUDs: stimulant (methamphetamine) use disorder treatment, an SUD for which acute impacts, such as overdose deaths, are likely, and tobacco use disorder treatment, an SUD for which acute impacts are less common. Models of CM for other SUDs would vary, depending on the SUD, the particulars of treatment, and the evidence of effectiveness.

The actual design of CM programs may differ materially from these hypothetical examples, but the selected pair are similar to models in current use[12] and to models that have been evaluated in the scientific literature (Anderson et al., 2018; Davis et al., 2016; Prendergast et al., 2006; Roll et al., 2006). The reasoning behind the selections for the particular designs modeled are as follows:

- CM program: CM can be used with a range of substance use treatment programs. CHBRP chose to model a methamphetamine use disorder treatment program given the rise of stimulant use nationally and in California, and the lack of medication to treat methamphetamine use disorders, as discussed in the *Background on Substance Use Disorders and Treatment* section. CHBRP chose to also model a tobacco use disorder treatment program as tobacco use disorder is the most prevalent SUD in California and ranks as the leading cause of preventable illness and death in the state, as discussed in the *Background on Substance Use Disorders and Treatment* section.
- CM added to an existing SUD treatment program: While there are CM programs that exist as standalone, CM services are typically provided in conjunction with SUD treatment programs. [13]
- CM duration (for a particular program): The length of the models follow descriptions of CM efforts that have been evaluated in the scientific literature. Programs are most often 12 weeks; however, programs can vary from 4 weeks to 52 weeks (Prendergast et al., 2006). The longer CM (over 12 weeks) has also been documented, but the evidence suggests a decreasing effect of CM longer than 12 weeks (Benishek et al., 2014). For these reasons, CHBRP has modeled CM as lasting 12 weeks for the methamphetamine example and 4 weeks for the tobacco session example.

[12] Personal Communication, L. Coughlin. March 2020
[13] Personal Communication, L. Coughlin, March 2020

- CM goal behavior: Increased abstinence from drug use (as established by testing, such as urinalysis) and increased participation in treatment (as established by greater participation in counseling) are the primary outcomes described in the literature (see the *Medical Effectiveness* section). For this reason, CHBRP has modeled these goal behaviors in the examples presented in this section. It should be noted that there may be other CM goals that are not modeled below.
- CM reward: A variety of reward forms are documented in the literature, but vouchers for redemption of treatment program-approved objects (food, toiletries, etc.) are utilized most frequently in CM for SUDs (Prendergast et al., 2006). For this reason, CHBRP has modeled rewards as vouchers.
- CM reward amount: A wide range of reward amounts are documented in the literature, Incentives ranged from zero (patients gave a deposit that was at risk) to between $45 and $1185 (Notley et al., 2019). CHBRP modeled a $20 reward, with a maximum of $480, for the methamphetamine example and a $15 reward, with a maximum reward of $60, for the tobacco session example.

These examples are presented as background for considering the possible utilization and cost of impacts of adding CM services to SUD treatment programs for Medi-Cal beneficiaries.

For further details on the underlying data sources and methods used in this analysis, please see Appendix C.

Baseline and Postmandate Benefit Coverage

All Medi-Cal beneficiaries have coverage for SUD treatment. Treatment for tobacco use disorder is through Medi-Cal managed care, which is obtained through enrollment of Medi-Cal beneficiaries in plans regulated by the Department of Managed Health Care (DMHC) or County Organized Health System (COHS) programs. Treatment for other SUDS for Medi-Cal beneficiaries is primarily through the statewide Drug Medi-Cal program (DHCS, 2019b).

Currently CM services are not mentioned as a core Medi-Cal benefit (DHCS, 2019a). It is possible that CM programs run by certain SUD providers exist in California. However, CHBRP is unaware of any of those services being currently part of Medi-Cal covered benefits.

As the amount of funding that would be available, if any, is unknown, CHBRP has modeled a limited expansion — for only 1,000 beneficiaries — intending to provide two examples that could be scaled larger, depending on the amount of available funds.

Baseline and Postmandate Utilization

CHBRP assumes that CM services will be provided to Medi-Cal beneficiaries either enrolled or initiating enrollment in outpatient SUD treatment programs. As CHBRP is unaware of evidence to the contrary, CHBRP expects no increase in annual enrollment in SUD treatment as a result of SB 888.

For Medi-Cal beneficiaries enrolled in outpatient SUD treatment programs with CM:

- For the duration of the CM program, CHBRP expects SUD treatment attendance to increase (DePhilippis et al., 2018), which will result in increases in counseling and, depending on the design of the CM, increases in lab testing.
- For the duration of the CM program, CHBRP expects additional days of abstinence (Anderson et al., 2018; De Crescenzo et al., 2018; Hagedorn et al., 2013; Predergast et al., 2006). However, CHBRP is unaware of evidence supporting measurably lowered use of SUD-related services,

such as emergency department visits or hospitalization, during CM or throughout the remainder of the year after CM.

- For the duration of the CM program, as is often the case with greater engagement with SUD treatment programs, CHBRP expect some increase in use of health services not related to SUDs (Olmstead et al., 2012), such as dental appointments or annual screenings, but cannot quantify the utilization of such during or shortly after the duration of CM.

Although SB 888 does not specify the structure of the program or how providers will be reimbursed, the CHBRP models offered assume reimbursement of SUD treatment providers' delivery of CM to Medi-Cal beneficiaries using fee-for-service reimbursement for services plus an annual capped reward amount per beneficiary. CHBRP also modeled administrative costs associated with the program that may be implemented in various ways.

Baseline and Postmandate Per-Unit Cost

CHBRP estimates no change in the per-unit cost of SUD treatment or the unit cost of health services not directly related to SUDs.

The per-unit cost of the reward vouchers is dependent on CM designs. For the purposes of modeling, CHBRP assumes a $20 reward for achieving a goal behavior in Model 1 and a $15 reward in Model 2 (see details below).

CHBRP estimates there will be administrative costs associated with the availability of CM, as vouchers must be printed, vendor negotiations completed, vouchers stored in a theft-proof manner, the CM program offered to potential participants, results monitored, and vouchers distributed. Training cost are expected to be highest during the first year of implementation. There will also be ongoing administrative costs for the purchase, tracking, and distribution of rewards, vouchers, and other incentives. Administrative costs would vary according to the size and scale of the program.

Example of Contingency Management Services

Below are two example models of CM services for SUD treatment programs, one related to methamphetamine use disorder and one related to tobacco use disorder.

Model 1: 12-Week Contingency Management Program Associated with Outpatient Treatment Program for Methamphetamine Use Disorder

The first model is for CM added to an outpatient methamphetamine use disorder treatment program. The treatment program, which runs longer than 12 weeks, includes counseling and urine testing, which are covered services for Medi-Cal beneficiaries.

Following the overall structure of the methamphetamine use disorder treatment program, the CM program for Model 1 has the following parameters:

- At the SUD treatment provider's discretion, the CM program can begin at any time during the year, but each beneficiary can only participate in one 12-week CM program.
- Duration of the CM program addition to the SUD treatment program lasts 12 weeks for each beneficiary. The model describes total impact, but staggered enrollment could mean a provider offering CM throughout the entire year.
- The SUD treatment program includes group counseling session. The maximum number of outpatient counseling sessions during the 12 weeks of CM is 24 (2 sessions per week).

- Urine samples are collected and tested at each group counseling sessions for a maximum of 24 times during the 12 weeks of CM.
- For each negative urine sample, participants receive a voucher for $20 (redeemable at program-selected vendors for food, toiletries, and other program-approved items).
- The maximum cash value of the CM program per participant is $480.

Table 2 below shows the expected costs for this hypothetical program with and without CM. It is reasonable to expect higher attendance for the SUD treatment program with CM services. For the purposes of this model, CHBRP assumes an average of 90% attendance at group counseling sessions with CM compared to an average of 80% attendance at group counseling sessions for the SUD treatment program without CM (Roll et al., 2006). Typically, CHBRP would expect to see attendance highest at the start of a program and decreasing over the duration of the program.

CHBRP assumes all participants submit urine samples at each group counseling session they attend. CHBRP estimates 60% of the urine samples are negative for participants with CM compared to 40% for participants without CM. This is based on results found in the literature, although there could be significant differences in the participants and program parameters (Roll et al., 2006).

Table 2. Expected Costs for Methamphetamine Use Disorder Treatment Program with and without Contingency Management for 1,000 Medi-Cal Beneficiaries

	Unit Cost	Rate	Total Utilization	Total Cost
SUD Treatment without CM				
Group Counseling Sessions	$21.00	80% (a)	19,200	$403,200.00
Urinalysis	$3.00	100% (b)	19,200	$57,600.00
Total Cost				**$460,800.00**
SUD Treatment with CM				
Group Counseling Sessions	$21.00	90% (a)	21,600	$453,600.00
Urinalysis	$3.00	100% (b)	21,600	$64,800.00
Reward Cost per Negative Test	$20.00 (c)	60% (d)	12,960	$259,200.00
Administration of CM Rewards				$52,000.00 (e)
Total Cost				**$829,600.00**

Source: California Health Benefits Review Program, 2020.

Notes: (a) This is the expected average rate of attendance at group counseling.

(b) The expected rate of urine testing matches the expected average attendance at group counseling.

(c) The reward unit cost includes the cost of the voucher.

(d) This is the expected rate of urine samples negative for methamphetamine for which vouchers will be rewarded.

(e) The administration cost includes only the cost of operating the CM rewards program, such as negotiating with vendors, the vendor cost of the voucher, and the cost of printing, securing from theft, and distributing vouchers.

Key: CM = contingency management; SUD = substance use disorder.

As suggested in the *Background on Substance Use Disorders and Treatment* and *Medical Effectiveness* sections and as projected in the *Public Health* section, additional desirable health outcomes are expected

for beneficiaries participating in CM due to greater utilization of the SUD treatment program's group counseling service. However, CHBRP does not project measurable cost offsets due to reductions in utilization of other health care services (such as emergency department visits) for intermittent or continuous abstinence during a 12-week SUD program as there is not sufficient evidence in the published literature to project any applicable cost offsets. Similarly, as there is not sufficient evidence to project additional posttreatment or long-term abstinence, no long-term offsets or savings are projected.

Model 2: Four-Week Contingency Management Program Associated with Outpatient Treatment Program for Tobacco Use Disorder

The second model is CM added to promote engagement in a telephone counseling for a tobacco use disorder treatment program. The treatment program, which runs for 4 weeks, consists of phone counseling sessions and nicotine patches mailed to participants' homes, which are covered services for Medi-Cal beneficiaries.

Following the overall structure of the phone-based tobacco use disorder treatment program, the CM program for Model 2 has the following parameters:

- Duration of the SUD program is 4 weeks.
- The program includes individual phone counseling sessions no shorter than 10 minutes in duration. The maximum number of phone counseling sessions is 4. Nicotine patches are mailed to all participants who complete the first phone counseling session.
- For each participation in a phone counseling session, participants receive a $15 voucher (redeemable at program-selected vendors for food, toiletries, and other program-approved items).
- The maximum cash value of the CM program per participant is $60.

Table 3 below shows the expected costs for this hypothetical program with and without CM. It is reasonable to expect higher attendance for the SUD treatment program with CM. For the purposes of this model, CHBRP assumes approximately 95% of participants will utilize the first individual phone counseling session with CM compared to 85% of participants utilizing the first individual phone counseling session for the SUD treatment program with no CM. CHBRP also estimates utilization will decrease to 65% by the last phone counseling session for the SUD treatment program with CM compared to 40% utilization without CM. This is based on results found in the literature, although there could be significant differences in the participants and program parameters (Anderson et al., 2018).

Table 3. Expected Costs for Tobacco Use Disorder Treatment Program with and without Contingency Management for 1,000 Medi-Cal Beneficiaries

	Unit Cost	Rate	Total Utilization	Total Cost
SUD Treatment				
Nicotine Patches	$81.00	85% (a)	850	$68,850.00
Phone Counseling Session 1	$50.00	85% (b)	850	$42,500.00
Phone Counseling Session 2	$50.00	70% (b)	595	$29,750.00
Phone Counseling Session 3	$50.00	55% (b)	468	$23,375.00
Phone Counseling Session 4	$50.00	40% (b)	340	$17,000.00
Total Cost				**$111,350.00**

SUD Treatment with CM				
Nicotine Patches	$81.00	95% (a)	950	$76,950.00
Phone Counseling Session 1	$50.00	95%(b)	950	$47,500.00
Phone Counseling Session 2	$50.00	85% (b)	808	$40,375.00
Phone Counseling Session 3	$50.00	75% (b)	713	$35,625.00
Phone Counseling Session 4	$50.00	65% (b)	618	$30,875.00
Reward Cost - Participation	$15.00	-	3,088 (c)	$46,320.00
Administration of CM Rewards				$40,000.00 (d)
Total Cost				**$317,645.00**

Source: California Health Benefits Review Program, 2020.

Notes: (a) The expected rate of receiving nicotine patches matches the expected participation in phone counseling session 1.

(b) This is the expected rate of participation in phone counseling session.

(c)This is the total number of phone counseling sessions attended for which vouchers will be rewarded.

(d) The administration cost includes only the cost of operating the CM rewards program, such as negotiating with vendors, the vendor cost of the voucher, and the cost of printing, securing from theft, and distributing vouchers.

The literature suggests a 4-week tobacco use disorder treatment program with CM can result in higher rates of abstinence over a longer time period. One study of the Medi-Cal population found a 13% increase in cessation at 6 months for tobacco use disorder treatment with CM, compared to one without CM (Anderson et al., 2018).

There is not sufficient evidence to project applicable cost offsets or savings (such as would result from reduced emergency department visits or hospitalizations) for during treatment or following months' posttreatment abstinence.

As suggested in the *Background on Substance Use Disorders and Treatment* and *Medical Effectiveness* sections and as projected in the *Public Health* section, additional desirable health outcomes are expected for beneficiaries participating in CM due to greater utilization of the SUD treatment program's counseling service. However, CHBRP does not project measurable cost offsets resulting from reductions in other health care services (such as emergency department visits or hospitalizations) within one year of completion of the CM program shown in our example. There is not sufficient evidence to project cost offsets or savings attributable specifically to CM services added to tobacco use disorder treatment.

As discussed in the *Policy Context* section, the Centers for Medicare and Medicaid Services (CMS) impose an annual maximum limit of $75 per enrollee on incentives (Glass et al., 2020). As indicated in the *Medical Effectiveness* section, there needs to be a high enough incentive for CM services to be effective and change behavior. Effective minimum levels of incentive payments could be as high as $500 per member, exceeding the current maximum of $75 per member. Rules on the use of federal or state dollars under the Medicaid program for CM program payments is currently under consideration.

Additional Administrative Expenses and Other Expenses

In addition to the administrative costs to providers running the CM programs in addition to SUD programs, there would be administrative costs incurred by the Department of Health Care Services and counties that

administer the Medi-Cal program. CHBRP is unable to estimate such additional administrative costs that would accrue to the Medi-Cal program.

PUBLIC HEALTH IMPACTS

As discussed in the *Policy Context* section, for some Medi-Cal beneficiaries, SB 888 could create coverage of contingency management (CM) programs for treating substance use disorders (SUD). The public health impact analysis includes estimated impacts in the short term (within 12 months of implementation) and in the long term (beyond the first 12 months postmandate). This section estimates the short-term impact[14] of SB 888 on abstinence, treatment adherence, medication adherence, and potential disparities.

Estimated Public Health Outcomes

CM is a type of behavioral therapy in which individuals are "reinforced," or rewarded, for evidence of positive behavioral change (Petry, 2011). CM typically consists of monetary-based rewards or vouchers to reinforce abstinence from the target drug or to encourage retention in pharmacological or psychosocial treatment (Petry, 2011). As presented in the *Benefit Coverage, Utilization, and Cost Impacts* section, with the amount of funding that would be available unknown, CHBRP has purposefully modeled a limited expansion — for only 1,000 beneficiaries — intending to provide two examples that could be scaled larger, depending on the amount of available funds. These two examples, methamphetamine use disorder and tobacco use disorder serve as case studies on what the cost and utilization implications would be of Medi-Cal enrollees getting treatment for SUD with and without CM. As presented in the *Medical Effectiveness* section, evidence varies by SUD regarding the impact of CM. For tobacco use disorder, there is clear and convincing evidence of effectiveness of CM to increase posttreatment abstinence. For stimulant use disorder, including methamphetamine, there is a preponderance of evidence of effectiveness of CM increasing treatment retention and during-treatment abstinence, though there is limited evidence that it does not increase posttreatment abstinence. Although CM plus community reinforcement approach has the highest adjusted odds of abstinence at follow-up at around 1 year compared to other combinations of psychosocial interventions, there is nothing in SB 888 that would require this approach to be utilized (De Crescenzo et al., 2018). The public health implications of these two simulations are discussed below.

Model 1: Stimulant Use Disorder — Methamphetamines

This simulation projected that for every 1,000 Medi-Cal enrollees engaged in treatment for stimulant use disorder, specifically with methamphetamines, there would be 19,200 group counseling appointments and urinalysis tests without CM increasing to 21,600 with treatment using CM. As shown in Table 2 this would lead to an additional 2,400 group counseling sessions attended and urinalyses performed. Therefore, for every 1,000 Medi-Cal enrollees engaged in SUD treatment using CM, CHBRP would expect 60% of the 2,400 additional samples to be negative, leading to an increase in abstinence as measured by 1,440 additional negative urine samples overall. In addition, there would be an increase of negative urine samples among those who would have attended treatment without CM, but would have submitted a positive urine sample of 3,480 for a total of 5,280 additional negative urine samples. This translates roughly into more than 15,000 additional methamphetamine-free days. Based on the literature, CHBRP would not expect these abstinence rates to persist in the long term outside of the treatment environment (De Crescenzo et al., 2018).

Addiction often involves cycles of relapse and remission, can vary in severity, and often requires ongoing professional treatment, lifestyle changes, and case management (ASAM, 2011; Goodwin, 2014). Therefore, although abstinence is not expected to persist posttreatment, achieving periods of abstinence is still one goal of treatment as the best predictor of longer-term abstinence is abstinence during treatment (Carroll et al., 2006; Higgins et al., 2000; Petry et al., 2007).

[14] CHBRP defines short-term impacts as changes occurring within 12 months of bill implementation.

In addition, as there is no FDA-approved medication to treat stimulant use disorder, CM to improve treatment engagement and abstinence may be the best treatment option available, especially if paired with community reinforcement approach.

Patients addicted to methamphetamine are at higher risk for a range of physical and psychological issues including mental illness, cognitive issues, antisocial behaviors, cardiovascular events, sexually transmitted diseases, and blood-borne infections including HIV and hepatitis B and C, and consequently are at increased risk of death (DeCrescenzo et al., 2018). The rate of amphetamine-related overdose deaths was 5.8/100,000 Californians in 2018 (2,427 deaths) (CDPH, 2019). Methamphetamine has taken over as the leading cause of overdose deaths in California, followed by the rate of all opioid overdose deaths of 5.23/100,000 (CDPH, 2018). In addition, impacts of methamphetamine use are exacerbated by its association with increased violence and crime (DeCrescenzo et al., 2018). Other downstream effects of methamphetamine use include reduced work-related productivity and increased family and housing instability. It is possible that the additional 15,000 methamphetamine-free days among the 1,000 Medi-Cal enrollees in this simulation would lead to reductions in many of these short-term outcomes.

Disparities exist in the rates of overdoses due to amphetamines by race/ethnicity and gender. The California Opioid Overdose Surveillance Dashboard shows that blacks had the highest rates of hospitalizations for amphetamine overdose (10.6/100,000), which were more than double rates of whites (5.76 per 100,000), Latinos (4.97 per 100,000), Native Americans (4.44 per 100,000), and Asians (0.69 per 100,000) (CDPH, 2019). Yet, Native Americans had the highest amphetamine overdose mortality rates in California in 2018 (13.9/100,000), followed by black and white ethnic groups (9.9 deaths/100,000 and 9.5 deaths/100,000, respectively). Asians had the lowest amphetamine overdose mortality rate at 1.4/100,000 (CDPH, 2019). Disparities by gender existed in the rates of ER visits for amphetamine overdoses and deaths with males being more than twice as likely to have an ER visit for an overdose (6.7/100,000 vs. 3.1/100,000) and more than three times as likely to die from amphetamine overdose (9.3 deaths/100,000 and 2.9 deaths/100,000, respectively) (CDPH, 2019).

In the first year postmandate, CHBRP estimates that for every 1,000 Medi-Cal enrollees engaged in SUD treatment, adding CM to this treatment would result in an increase in 5,280 stimulant-free urine samples (15,000 methamphetamine-free days) and an increase in engagement in treatment for stimulant use disorder by 2,400 group counseling sessions. Although the quantitative impact of SB 888 on premature death associated with methamphetamine is unknown; it stands to reason, based on the effectiveness of CM for stimulant use disorders, there could be a reduction in premature deaths due to overdose during periods of abstinence for those enrollees who undergo treatment for their SUD(s) as well an increase in productivity due to an increased ability to work for those who are abstinent. In addition, due to higher rates of enrollment of blacks in Medicaid, there is potential to reduce the disparity in overdose by race/ethnicity.

Model 2: Tobacco Use Disorder

This simulation projected that for every 1,000 Medi-Cal enrollees engaged in treatment for tobacco use disorders using CM that there would be 836 additional counseling sessions attended. As presented in the *Medical Effectiveness* section, Anderson et al. (2018) found that Medicaid enrollees who called the California Smokers' Helpline in the CM plus patch group had higher rates of abstinence at 6 months (13.2%) compared to the patch (10.3%) or usual care group (9.0%) (p-values = 0.02 and 0.017). In addition, they found that the CM plus patch group had a higher number of calls to the Helpline (6.2; 95% CI: 5.9–6.4) compared to the patch group (5.1; 95% CI: 4.8–5.3) or the usual care group (5.0; 95% 4.6–5.2) and a higher rate of making a quit attempt (68.4%) compared to the patch group (60.2%, p-value $\leq$0.0001) or the usual care group (54.3%, p-value $\leq$ 0.0001). Therefore, for every 1,000 Medi-Cal enrollees engaged in SUD treatment using CM, CHBRP would expect an increase quit attempts for 82 enrollees and abstinence at 6 months for 29 enrollees. Research has shown that former smokers recalled an average of 4.7 quit attempts before successfully abstaining, and that long-term cessation is more likely with each quit attempt. So although Anderson et al. (2018) did not report on impacts longer than 6

months, each quit attempt a person makes gets them one step closer to permanent cessation (CDPH, 2018).

Smoking is a known cause of significant morbidity and mortality. A deep and comprehensive literature links smoking to a multitude of conditions and diseases including cancers, cardiopulmonary disease, and poor birth outcomes (HHS, 2014). Additionally, secondhand smoke increases nonsmokers' risk of developing lung cancer, bronchitis, and pneumonia; exacerbates asthma; and causes poor birth outcomes (CDPH, 2018) all of which can lead to an increase in preventable health services utilization. Therefore, it is possible that there may be short-term benefits of abstinence among the 29 enrollees achieving abstinence at 6 months.

CDPH also reports significant variation in smoking prevalence among subpopulations. For example, there is a three-fold difference between the populations with the highest and the lowest smoking rates: 24.2% of American Indians as compared with 8.6% of Asian/Pacific Islanders. African Americans have the second highest rate of smoking in California (20.7%) followed by whites (13.0%) and Hispanics (11.5%). Medicaid has a higher rate of African Americans and Hispanics compared to the overall population in California. Therefore, adding CM to SUDs treatment in Medi-Cal may result in a reduction in the disparities faced by African Americans in relation to tobacco use rates and related health outcomes.

In the first year postmandate, CHBRP estimates that for every 1,000 Medi-Cal enrollees engaged in SUD treatment for tobacco use disorder, adding CM treatment would result in an increase in 82 additional enrollees making quit attempts and 29 more enrollees being abstinent from tobacco use at 6 months, likely leading to a reduction in relevant negative health impacts of tobacco use. In addition, due to higher rates of enrollment of African Americans in Medicaid, there is potential to reduce the disparity in tobacco-related use and morbidity by race/ethnicity.

LONG-TERM IMPACTS

In this section, CHBRP estimates the long-term impact of SB 888, which CHBRP defines as impacts occurring beyond the first 12 months after implementation. These estimates are qualitative and based on the existing evidence available in the literature. For this analysis, CHBRP modeled a 4-week and a 12-week substance use disorder (SUD) treatment program using contingency management (CM), one for methamphetamine and one for tobacco. It is unclear how many providers would choose to offer CM as part of SUD treatment and how many patients would participate in the long term. In addition, there is no research that examines long-term (> 1 year) impacts of CM for SUDs treatment on health care utilization, therefore it is not possible to estimate the long-term utilization and cost impacts of SB 888.

Some interventions in proposed mandates provide immediate measurable impacts (e.g., maternity service coverage or acute care treatments) while other interventions may take years to make a measurable impact (e.g., coverage for tobacco cessation or vaccinations). When possible, CHBRP estimates the long-term effects (beyond 12 months postmandate) to the public's health that would be attributable to the mandate. As presented in the *Medical Effectiveness* section, there is no research that examines the long-term impacts of CM for SUD treatment. As discussed previously, a key barrier to abstinence for any SUD is patient interest and readiness to abstain. CHBRP anticipates the demand for treatment of SUDs would continue as relapsed patients attempt abstinence again and first-time initiators would join the pool of patients seeking care. However, limited patient readiness for SUD treatment and limited number of providers remain significant barriers to care. To the extent that SB 888 results in an increase in SUD treatment with CM, and the extent to which this leads to long-term abstinence, it is possible SB 888 would contribute to reductions in substance use–related morbidity and mortality such as cardiovascular disease, cancer, HIV, and hepatitis C.

Tobacco use is the leading cause of preventable illness and death in the United States and California. The CDC estimates that smoking and exposure to tobacco smoke account for approximately 40,000 deaths annually in California and that 440,000 youth today will die prematurely due to tobacco exposure. A comprehensive epidemiological study reported that about 50% of deaths from 12 types of cancer are attributable to smoking, with more than 80% of lung cancer deaths attributable to smoking (Siegel et al., 2015). Despite California having the second lowest smoking rate in the United States (11.3%), lung cancer remains the leading cause of cancer deaths in the state with more than 12,000 deaths occurring in 2014 (ACS, 2017; CDC, 2017). Max et al. estimated that 17.1 years of potential life were lost per smoker due to smoking-related disease in California with no statistical difference between males and females (Max et al., 2009). Causes of premature death included premature birth, low birth weight, sudden infant death syndrome (SIDS), respiratory stress syndrome, lung cancer, heart disease, and asthma. There is evidence that smoking cessation can reverse negative health effects from tobacco and can produce similar reductions in morbidity and mortality that would be achieved through pharmaceutical interventions commonly prescribed for heart disease patients (Critchley and Capewell, 2003; Suskin et al., 2001). Other studies show that smoking cessation can boost life expectancy; cessation at age 35 years resulted in a predicted additional 7 to 8 years of life for men and a predicted additional 6 to 7 years of life for women (Jha et al., 2013; Taylor et al., 2002).

In a sample of 1,000 Medi-Cal smokers seeking treatment for tobacco use, CM is estimated to lead to an additional 29 patients being abstinent at 6 months. To the extent that these patients continue to be abstinent in the long term, we can expect a significant reduction in mortality and related lost productivity for this population.

APPENDIX A TEXT OF BILL ANALYZED

On February 26, 2020, the California Senate Committee on Health requested that CHBRP analyze SB 888.

SENATE BILL NO. 888

Introduced by Senator Wiener

January 23, 2020

An act to ~~amend Section 103426 of the Health and Safety Code, relating to vital records.~~ *add Section 14021.38 to the Welfare and Institutions Code, relating to Medi-Cal.*

LEGISLATIVE COUNSEL'S DIGEST

SB 888, as amended, Wiener. ~~Birth certificates.~~ *Substance use disorder services: contingency management services.*

Existing law provides for the Medi-Cal program, which is administered by the State Department of Health Care Services, and under which qualified low-income individuals receive health care services, including substance use disorder services that are delivered through the Drug Medi-Cal Treatment Program and the Drug Medi-Cal organized delivery system. The Medi-Cal program is, in part, governed and funded by federal Medicaid program provisions.

This bill would, to the extent funds are made available in the annual Budget Act, expand substance use disorder services to include contingency management services, subject to utilization controls. The bill would require the department to issue guidance and training to providers on their use of contingency management services for Medi-Cal beneficiaries who access substance use disorder services under any Medi-Cal delivery system, including the Drug Medi-Cal Treatment Program and the Drug Medi-Cal organized delivery system. The bill would provide that contingency management services are not a rebate, refund, commission preference, patronage dividend, discount, or any other gratuitous consideration. The bill would authorize the department to implement these provisions by various means, including provider bulletin, without taking regulatory action, and would condition the implementation of these provisions to the extent permitted by federal law, the availability of federal financial participation, and the department securing federal approval.

~~Existing law requires the State Registrar to issue a new birth certificate reflecting a change of gender to female, male, or nonbinary without a court order for any person born in this state who submits directly to~~

~~the State Registrar an application to change the gender on the birth certificate and an affidavit attesting under penalty of perjury that the request for a change of gender is to conform the person's legal gender to the person's gender identity and is not made for any fraudulent purpose.~~

~~This bill would make a technical, nonsubstantive change to this provision.~~

Vote: majority Appropriation: no Fiscal Committee: ~~no~~*yes* Local Program: no

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THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. *Section 14021.38 is added to the Welfare and Institutions Code, immediately following Section 14021.37, to read:*

14021.38. *(a) To the extent funds are made available in the annual Budget Act for this express purpose, substance use disorder services shall include contingency management services as a covered benefit, subject to utilization controls, as described in Section 14133.*

(b) The department shall issue guidance and training to providers on their use of contingency management services for Medi-Cal beneficiaries who access substance use disorder services under any Medi-Cal delivery system, including, but not limited to, the Drug Medi-Cal Treatment Program and the Drug Medi-Cal organized delivery system.

(c) Contingency management services are not a rebate, refund, commission preference, patronage dividend, discount, or any other gratuitous consideration, as described in Section 51478 of Title 22 of the California Code of Regulations.

(d) Notwithstanding Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code, the department may implement this section by means of a provider bulletin or similar instruction, without taking regulatory action.

(e) This section shall only be implemented to the extent permitted by federal law.

(f) This section shall be implemented only to the extent that federal financial participation is available and any necessary federal approvals have been obtained.

~~SECTION 1.Section 103426 of the Health and Safety Code is amended to read:~~

~~103426. The State Registrar shall issue a new birth certificate reflecting a change of gender to female, male, or nonbinary without a court order for any person born in this state who submits directly to the State Registrar an application to change the gender on the birth certificate and an affidavit attesting under penalty of perjury that the request for a change of gender to female, male, or nonbinary is to conform the person's legal gender to the person's gender identity and is not made for any fraudulent purpose. Upon receipt of the documentation and the fee prescribed by Section 103725, the State Registrar shall establish a new birth certificate reflecting the gender stated in the application and any change in name, if accompanied by a court order for a change of name.~~

APPENDIX B LITERATURE REVIEW METHODS

This appendix describes methods used in the medical effectiveness literature review conducted for this report. A discussion of CHBRP's system for grading evidence, as well as lists of MeSH Terms, publication types, and keywords, follows.

Studies of contingency management (CM) for substance use disorders (SUDs) were identified through searches of systematic reviews on PubMed, the Cochrane Library, and PsycINFO. The search was limited to abstracts of studies published in English and current through March 3, 2020. Of the 59 review articles identified, an additional eight review articles were identified through the process of reviewing articles for potential inclusion in this report on SB 888. In total, 22 studies were included in the medical effectiveness review for this report. The other articles were eliminated because they did not specifically review research related to CM or did not look at the outcomes of interest (as described below). A more thorough description of the methods used to conduct the medical effectiveness review and the process used to grade the evidence for each outcome measure is presented in Appendix B.

Reviewers screened the title and abstract of each citation retrieved by the literature search to determine eligibility for inclusion. The reviewers acquired the full text of articles that were deemed eligible for inclusion in the review and reapplied the initial eligibility criteria.

Evidence Grading System

In making a "call" for each outcome measure, the medical effectiveness lead and the content expert consider the number of studies as well the strength of the evidence. Further information about the criteria CHBRP uses to evaluate evidence of medical effectiveness can be found in CHBRP's *Medical Effectiveness Analysis Research Approach*.[15] To grade the evidence for each outcome measured, the team uses a grading system that has the following categories:

- Research design;
- Statistical significance;
- Direction of effect;
- Size of effect; and
- Generalizability of findings.

The grading system also contains an overall conclusion that encompasses findings in these five domains. The conclusion is a statement that captures the strength and consistency of the evidence of an intervention's effect on an outcome. The following terms are used to characterize the body of evidence regarding an outcome:

- *Clear and convincing evidence;*
- *Preponderance of evidence;*
- *Limited evidence;*
- *Inconclusive evidence; and*
- *Insufficient evidence.*

[15] Available at: http://chbrp.com/analysis_methodology/medical_effectiveness_analysis.php.

A grade of *clear and convincing evidence* indicates that there are multiple studies of a treatment and that the large majority of studies are of high quality and consistently find that the treatment is either effective or not effective.

A grade of *preponderance of evidence* indicates that the majority of the studies reviewed are consistent in their findings that treatment is either effective or not effective.

A grade of *limited evidence* indicates that the studies had limited generalizability to the population of interest and/or the studies had a fatal flaw in research design or implementation.

A grade of *inconclusive evidence* indicates that although some studies included in the medical effectiveness review find that a treatment is effective, a similar number of studies of equal quality suggest the treatment is not effective.

A grade of *insufficient evidence* indicates that there is not enough evidence available to know whether or not a treatment is effective, either because there are too few studies of the treatment or because the available studies are not of high quality. It does not indicate that a treatment is not effective.

Search Terms (* indicates truncation of word stem)

- Contingency Management
- Substance use disorder
- Opioid use disorder
- Stimulant use disorder
- Cannabis use disorder
- Alcohol use disorder
- Tobacco use disorder

APPENDIX C COST IMPACT ANALYSIS: DATA SOURCES, CAVEATS, AND ASSUMPTIONS

The cost analysis in this report was prepared by the members of the cost team, which consists of CHBRP task force members and contributors from the University of California, Los Angeles, and the University of California, Davis, as well as the contracted actuarial firm, Milliman, Inc.[16]

Information on the generally used data sources and estimation methods, as well as caveats and assumptions generally applicable to CHBRP's cost impacts analyses, are available at CHBRP's website.[17]

This appendix describes analysis-specific data sources, estimation methods, caveats, and assumptions used in preparing this cost impact analysis.

Analysis-Specific Caveats and Assumptions

This subsection discusses the caveats and assumptions relevant specifically to an analysis of SB 888.

CHBRP presented two hypothetical models of typical SUD outpatient treatment programs. Programs and CM structure have significant variation. The examples presented in this analysis are potential approaches for designing a CM program. Other approaches could result in significantly different costs.

- The average costs for group counseling sessions and urinalysis are based on an analysis of Medi-Cal paid claims.
- The average costs for nicotine patch and telephonic counseling session are based on average costs found in the literature (Anderson et al., 2018).
- The reward amounts and annual maximum reward per participant were chosen based on common incentives in the literature (Anderson et al., 2018; Roll et al., 2006).
- For the methamphetamine use disorder example, CHBRP assumed:
    - An attendance rate of 80% for an SUD outpatient treatment program without CM and an attendance rate of 90% for an SUD outpatient treatment program with CM (Roll et al., 2006).
    - 60% of the urinalysis were negative for the outpatient SUD treatment program with CM (Roll et al., 2006).
- For the tobacco use disorder example, CHBRP assumed:
    - 85% of participants without CM received the nicotine patches and that 95% of participants with CM received the nicotine patches (Anderson et al., 2018).
    - 95% of participants had the initial telephonic counseling session, declining to 65% for the fourth counseling session (Anderson et al., 2018).

[16] CHBRP's authorizing statute, available at http://chbrp.com/CHBRP authorizing statute_2018_FINAL.pdf, requires that CHBRP use a certified actuary or "other person with relevant knowledge and expertise" to determine financial impact.
[17] See method documents posted at http://chbrp.com/analysis_methodology/cost_impact_analysis.php; in particular, see *2019 Cost Analyses: Data Sources, Caveats, and Assumptions*.

- Reward voucher amounts are based reward amounts for similar SUD treatment programs identified in the relevant CM literature (Anderson et al., 2018; DePhilippis et al., 2018; Notley et al., 2019; Roll et al., 2006).

Determining Public Demand for the Proposed Mandate

Not applicable.

Second Year Impacts on Benefit Coverage, Utilization, and Cost

CHBRP has not considered whether continued implementation during the second year of the benefit coverage requirements of SB 888 would have a substantially different impact on utilization of either the tests, treatments, or services for which coverage was directly addressed, the utilization of any indirectly affected utilization, or both. SB 888 is dependent on the funds available for CM services, which will be a limiting factor in any projections.

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A group of faculty, researchers, and staff complete the analysis that informs California Health Benefits Review Program (CHBRP) reports. The CHBRP **Faculty Task Force** comprises rotating senior faculty from University of California (UC) campuses. In addition to these representatives, there are other ongoing researchers and analysts who are **Task Force Contributors** to CHBRP from UC that conduct much of the analysis. The **CHBRP staff** coordinates the efforts of the Faculty Task Force, works with Task Force members in preparing parts of the analysis, and manages all external communications, including those with the California Legislature. As required by CHBRP's authorizing legislation, UC contracts with a certified actuary, **Milliman**, to assist in assessing the financial impact of each legislative proposal mandating or repealing a health insurance benefit.

The **National Advisory Council** provides expert reviews of draft analyses and offers general guidance on the program to CHBRP staff and the Faculty Task Force. CHBRP is grateful for the valuable assistance of its National Advisory Council. CHBRP assumes full responsibility for the report and the accuracy of its contents.

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CHBRP assumes full responsibility for the report and the accuracy of its contents. All CHBRP bill analyses and other publications are available at www.chbrp.org.

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