Appendix Table 1. Inclusion and exclusion criteria

| **PICOTS** | **Inclusion and Exclusion Criteria** |
| --- | --- |
| **Population** | **Include:** Adults over 18 years enrolled in medications for opioid use disorder (MOUD) program for opioid use disorder, persons soon to be released from incarceration (e.g., released to the community during the study)  **Exclude:** Special populations (e.g., people younger than 18 years of age, pregnant persons, palliative care/end-of-life, HIV, persons incarcerated for the duration of the study) |
| **Intervention** | **Include:** Medication formulation (e.g., extended-release), psychosocial adjuncts (e.g., counseling, Cognitive Behavioral Therapy [CBT], peer support, 12-step programs, mindfulness therapy), contingency management, care settings/logistical support (e.g., MOUD setting, low-threshold models), financial support (e.g., MOUD medication/program reimbursement), and health information technology (IT) |
| **Comparator** | **Include:** Comparator groups, (e.g., treatment as usual [TAU]) must also consist of individuals with access to MOUD, including usual referral and enrollment in outpatient in-person treatment programs, daily MOUD formulations, XR formulations) |
| **Outcomes** | **Include\***  Primary:  Treatment retention  Secondary:  Mortality  Harms |
| **Timing** | **Include:** Retention in MOUD was evaluated for at least 3 months. |
| **Setting** | **Include:** Only studies conducted in countries ranked as Very High Human Development by the United Nations’ Development Programme’s 2018 Statistical Update “Human Development Indices and Indicators.” Outpatient MOUD only. |
| **Study design** | **Include:** High quality systematic reviews, randomized control trials, observational studies (non-randomized studies with control groups) |
| **Language** | **Include:** English |

\* Systematic reviews and primary studies were included only if they report the primary or secondary outcomes of interest. PICOTS= population, intervention, comparator, outcomes, timing, setting; MOUD= medications for opioid use disorder; CBT= cognitive behavioral therapy; IT= information technology; TAU = treatment as usual; XR = extended-release; HIV= human immunodeficiency virus

Table 2. Published literature on care settings, services, and logistical support

| **Author, Year,**  **Study Design**  **Country** | **Number of Participants**  **Participant Characteristics** | **MOUD Medications** | **Timing & Outcome** | **Interventions** | **Results** | **Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- |
| **Pre-release MOUD settings** | | | | | | |
| **Hedrich, 2012,1**  **SR** | 27 articles | Methadone, buprenorphine and methadone, buprenorphine-naloxone, levo-alpha acetyl methadol (LAAM) | 6 months after release  Retention: % participants remaining in MOUD | Intervention: MOUD in prison  vs  Control: No MOUD in prison | KQ1: More than 50% [range 27-75%] retained in intervention group vs fewer than 5% [range 0-9%] retained in control group  KQ2: Not reported  KQ3: Not reported | Good |
| **Friedmann, 20182**  **RCT**  **USA** | 15  Pre-release v Post-release  n=9 vs 5  Mean Age= 38.9 vs 33.6  Gender: 7% female  Race/Ethnicity: 17% non-White  Years education: 11.6 vs 11.0  Employed: 14.1 vs 33.3  ASI drug risk: 1.9 vs 1.0 | Naltrexone (XR and injection) | 6 months  Retention:  1. Injections received  2. Percentage who received all 6 monthly injections  3. Treatment appointments attended | Pre-release intervention: Participants received 1 XR-naltrexone injection 1-2 weeks prior to release from prison plus up to 5 monthly injections in community  vs  Post-release: No pre-release injection. Up to 6 post-release injections in community | KQ1: Mean (SD) number of injections received (p-values not reported): 2.8(1.9) pre-release vs 1.3(1.9) post-release  Received all 6 injections: 2/9 (22%) in pre-release group vs 0/6 (0%) in post-release group  Treatment appointments attended: 46% pre-release group vs 22% post-release group  KQ2: Not reported  KQ3: Not reported | Poor |
| **Gordon, 2017**3  **2 x 2 factorial design RCT**  **USA** | 213  Mean Age: 39.08(8.8) years  Gender: 29.9% female  Race/Ethnicity: 70.1% African American;  25.6% White  Prior drug treatment: 81.9%  Prior buprenorphine treatment: 15.2%  # heroin use days prior to incarceration: 24.45(10.1) | Buprenorphine | 12 months  Retention: Days in treatment program post-release up to 12 months | 2 (Pre-release Treatment Condition: Buprenorphine Treatment Vs. Counseling Only) x 2 (Post-Release Service Setting: OTP vs. CHC)  Buprenorphine began either (1) in prison and continue care in an OTP or in (2) an outpatient substance abuse program within a CHC; or to begin buprenorphine after release from prison (3) in an OTP or (4) in the CHC  Post-release: titrated dose to 8 mg/day, then 16 mg 3x/week. | KQ1: Mean (SE) number of days retained in treatment: 65.9(12.2) pre-release vs 21.8(7.6) post-release (p=0.005)  KQ2: Not reported  KQ3: No differences in retention outcomes by gender | Fair |
| **Integrated MOUD into Psychiatric and Primary Care** | | | | | | |
| **Brooner, 20134**  **RCT**  **USA** | 316  A vs B:  n= 160 vs 156  Mean Age: 40.2(0.71) vs 39.4(0.68)  Gender: 62.5% vs 62.2% female  Race/Ethnicity: 42.5% vs 40.4% minority race  Education: 11.14 vs 10.88  Employed: 12.5% vs 16.7%  Cocaine: 31.9% vs 26.3% | Methadone | 12 months  Retention:  1. % participants remaining in substance abuse treatment at 12 months  2. Treatment days over 12 months | On-site and integrated substance abuse and psychiatric care with methadone  vs.  Off-site and non-integrated substance abuse and psychiatric care. Traditional specialty methadone outpatient treatment program | KQ1: Completed 12-month substance abuse treatment: 41.3% on-site vs 41.0% off-site (p=0.96)  Mean (SE) treatment days: 226.0 (10.8) on-site vs 228.7(10.7) off-site (p=0.89)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Carrieri, 20145**  **RCT**  **France** | 195  Primary care (PC) vs Specialized care (SC):  n=147 vs 48  Mean Age: 32[27-38] vs 30[27-39]  Gender: 14% vs 21% female | Methadone | 12 months  Retention: % participants retained in methadone treatment | Integration of methadone into primary care (PC)  vs.  Methadone received in specialty clinic setting (SC) | KQ1: Retention: 33/48 (69%) in SC vs 129/147 (88%) in PC were still in treatment. pLog rank=0.13 (per protocol analysis)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Miotto, 20126**  **RCT**  **USA** | 94  Opioid-treatment program (OTP) vs psychiatrist’s private practice (PCS) vs manualized matrix model (MMM):  Mean Age: 34.51(10.47) vs 36.46(9.76) vs 35.24(9.88)  Gender: 32.14% vs 48.48% vs 42.42% female  Race/Ethnicity: 42.86% vs 57.58% vs 69.70% White  Unemployed: 17.86% vs 21.21% vs 27.27% | Buprenorphine | 12 months  Retention:  1. Weeks retained: Number of weeks between induction and the last day the participant was assessed during treatment period  2. % of group who were present at week 20 | PCS: physician provided supportive and educational counseling about drug abuse and recovery;  vs  Behaviorally oriented psychosocial treatment (MMM) using matrix recovery-relapse prevention model  vs  Usual care: Outpatient OTP | KQ1: Mean number of weeks retained: 18.52(21.77) PCS vs 24.85(22.09) MMM vs 13.96(14.96) OTP (p=0.11)  Present at week 20: 33.3% PCS vs 51.52% MMM vs 21.43% OTP (p=0.05)  KQ2: Not reported  KQ3: Not reported | Fair |
| **MOUD in ED/Hospital Settings** | | | | | | |
| **Liebschutz, 20147**  **RCT**  **USA** | 139  Mean Age: 40.5(11.8)  Gender: 18.8% female  Race/Ethnicity: 43.2% Non-Hispanic White  Mean Rate of Opioid Use: 20.8(9.7) days  Prior OAT 57(41.0) | Buprenorphine | 6 month outcomes from enrollment assessed  Retention:  1. Engagement in outpatient buprenorphine treatment at 6 months  2. Opioid agonist treatment (OAT) days -self-reported in the 30 days before 3-, 6-month interviews using standard 30-day timeline follow-back | Linkage group: received 12 mg buprenorphine/naloxone on day 2 and 16 mg on day 3 and remainder of hospitalization. Linked to hospital associated primary care buprenorphine OAT with initial intake within 7 days of discharge  vs  Treatment as usual (TAU) | KQ1: Engaged in OAT at 6 months: 12(16.7%) linkage group vs 2(3%) TAU group (p=0.007)  Self-report days of OAT use per 30 follow-up days: 16.4 linkage group vs 6.4 TAU group, P<.01.  KQ2: Not reported  KQ3: Not reported | Fair |
| **D’Onofrio, 20178**  **RCT**  **USA** | 290  Mean Age: 31.5 Gender: 24.1% female Race/Ethnicity: 75.5% White  Married: 11.0% Unemployed: 22.4%  Unstable Housing: 8.3%  Primary Opioid Heroin: 75.9% | Buprenorphine | 6 months and 12 months  Retention:  self-reported formal engagement in addiction treatment using Treatment Services Review instrument | ED initiated buprenorphine with linkage to outpatient primary care  vs  Referral (TAU)  vs  Brief Intervention of 10-15 minute manual-driven audio taped Brief Negotiation Interview conducted by study RA | KQ1: 6-month retention: 49/92 (53%) 95% CI 43–64 vs B. 42/70 (60%) 95% CI 48–72 vs C. 39/76 (51%) 95% CI 40– 63, p=0.546  12 months retention: A. 42/86 (49%) 95% CI 38–60 vs B. 36/73 (49%) 95% CI 38–61 vs. C 49/78 (63%) 95% CI 52–74, p = 0.136  KQ2: Not reported  KQ3: Not reported | Fair |
| **Logistical Support** | | | | | | |
| **Schwartz, 20179**  **RCT**  **USA** | 300  Mean Age: 42.7(10.1)  Gender: 41% female  Race/Ethnicity: 42% African American;  41% White | Methadone | 12 months  Retention:  1. Treatment retention in original OTP at 12 months  2. Enrollment at any MOUD program at 12 months  \*Treatment retention in original OTP was measured from program records and in any other OTP or buprenorphine treatment from self-report | Patient-centered methadone treatment (PCM): Encouraged but not required to attend individual/group counseling. Counselors served solely as therapists. Modified clinic rules. No administrative discharge.  vs  Treatment as usual (TAU) | KQ1: Retention at 12 months: 48.6% PCM group vs 46.3% TAU group, OR=0.91(0.58,1.44) Risk diff 0.02(-0.09,0.14) p=0.69  % enrolled in any OTP or buprenorphine treatment at 12 months: 78.9% PCM group vs 76.7% TAU group, OR= 0.88(0.48,1.62), p=0.68  KQ2: 4 non-study related deaths in TAU. 2 overdoses in TAU. PCM had 2 non-study related deaths, 1 from methadone overdose; 59 non-study related hospitalizations in TAU and 67 in PCM.  KQ3: Not reported | Good |
| **Beattie, 201610**  **RCT**  **UK** | 100  Gender: 16% female  Race/Ethnicity: 93.4% White; 6.1% Caribbean/Asian/Other  Had GP: 69%  Prior Treatment SUD: 90%  Current Mental Health Care: 12%  Homeless: 26% | Methadone | 3 months  Retention: Percentage of patients on opioid substitution treatment (OST) at 3-months after randomization | Treatment intervention at a syringe exchange program (SEP)  Intervention group: Script in a day" Offers immediate access to OST through referral to local specialist primary care center. Peer support volunteer accompanied participant to office, initiated on 30-40 mL methadone, and script for 6 days for 21 days, then transfer to GP practice  vs  Treatment as usual (TAU) | KQ1: In OST at 3-months: 51% intervention group vs 47% TAU group (OR 1.17 95% CI 0.54-2.57)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Kidorf, 201811**  **3 arm RCT**  **USA** | 212  Standard care intervention (SCI) vs Voucher reinforcement intervention (VRI) vs Low threshold intervention (LTI):  Mean Age: 40.3(10.9) vs 40.3(10.0) vs 38.8(9.4)  Gender: 54% vs 47% vs 65% male  Race/Ethnicity: 34 vs 43 vs 36% White  Education: 11.2(2.1) vs 11.5 (2.3) vs 11.3 (2.0)  Employed: 6% vs 13% vs 6%  HIV+: 3% vs 6% vs 9% | Methadone | 6 months  Retention: % retained at 90 days and 180 days | Treatment intervention at a syringe exchange program (SEP)  Voucher reinforcement intervention (VRI): SCI supplemented with contingency management - contingent on adherence to daily schedules of dosing and counseling. One time per week based on adherence the prior week. Initial value $12, maximum $174, $30 bonus for 3 weeks of adherence, earnings were exchanged for goods/services from local community  vs  Low threshold intervention (LTI): Participants excluded from adaptive treatment. Only required to attend 1 counseling session/month.  vs  Standard care intervention (SCI): Routine program, evidenced-based adaptive treatment model | KQ1: 90 day retention: 34% VRI vs 35% LTI vs 31% SCI (p=0.28)  180 day retention: 34% VRI vs 37% LTI vs 29% SCI (p=0.36)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Parpouchi, 201812**  **RCT**  **Canada** | 97  Mean Age: 39.1(8.9)  Gender: 36.5% female  Race/Ethnicity: 56.7% White; 20.6% Indigenous; 22.7% Other  Unemployed:94.8% | Methadone | Retention:  Medication possession ratio (MPR): Proportion of days during an observation period for which a person has been dispensed medication between randomization and end of study period (March 31, 2013) or date of death. | Housing first (HF) model: 3 interventions:1) market rental apartments with associated assertive community treatment (ACT) teams; 2) market rental + intensive case management; 3) dedicated building with integrated health and social service providers on-site.  vs  Treatment as usual (TAU) referral to housing | KQ1: Mean MPR: 0.52 HF group vs 0.57 TAU group (p=0.559)  KQ2: Not reported  KQ3: Not reported | Fair |

MOUD= medications for opioid use disorder; SR= systematic review; RCT= randomized controlled trial; n=number of participants; LAAM= levo-alpha acetyl methadol; KQ= key question; XR= extended-release; NTX= naltrexone; SD= standard deviation; OTP= opioid treatment program; CHC= community health center; SE= standard error; PC= primary care; SC= specialized care; PCS= psychiatrist’s private practice; MMM= manualized matrix model; OAT= opioid agonist treatment; TAU= treatment as usual; ED= emergency department; PCM= patient-centered methadone treatment; OST= opioid substitution treatment; SEP= syringe exchange program; SCI= standard care intervention; VRI= voucher reinforcement intervention; LTI= low threshold intervention; MPR= medication possession ratio; HF= housing first; ACT= assertive community treatment

Table 3. Published literature on contingency management

| **Author, Year**  **Study Design**  **Country** | **Number of Participants**  **Participant Characteristics** | **MOUD Medications** | **Timing & Outcome** | **Intervention** | **Results** | **Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- |
| **Amato,**  **201113**  **SR** | 4319 | Methadone  Buprenorphine Levo-alpha acetyl methadol  (LAAM) | Timing variable (6 - 48 weeks)  Retention: # participants in treatment at the end of the study | Any psychosocial / behavioral + any agonist maintenance treatment  vs  Standard agonist treatment | KQ1: Results do not show benefit for retention in treatment (26 studies, 2582 participants)  KQ2: Not reported  KQ3: Not reported | Good |
| **DeFulio, 201214**  **RCT**  **USA** | 38  Contingency group:  Gender: 58% female  Race/Ethnicity: 84% African American  Unemployed over past 3 years: 74%  Control group:  Gender: 26% female  Race/Ethnicity: 95% White  Unemployed over past 3 years: 58% | Naltrexone injections | 6 months  Retention: % of participants who completed entire course of naltrexone injections | CM: Access to therapeutic workplace contingent upon acceptance of naltrexone injection  vs  Prescription: Access to therapeutic workplace noncontingent upon acceptance of naltrexone injection | KQ1: 74% CM group vs 25% prescription group,  χ2 (1) = 8.53, *p* = .004  KQ2: Not reported  KQ3: Not reported | Fair |
| **Dunn,**  **201315**  **RCT**  **&**  **Dunn,**  **201516**  **RCT**  **USA** | 67  Mean Age: 45  Gender: 39% female  Race/Ethnicity: 86% African American | Oral naltrexone | Retention:  1. % of participants who completed course of medication. 26 weeks.  2. % of participants who had naltrexone-positive urine screens at 100% of 30-day check-points.  3. Self-reported drug treatment in 30 days before 12 month assessment16 | CM: Access to therapeutic workplace contingent upon supervised ingestion of medication  vs  Prescription: Access to therapeutic workplace noncontingent upon medication ingestion. | KQ1: Completed course of medication: 54% CM group vs 16% prescription group (p<0.01)  Naltrexone-positive urine screens at 100% of 30-day check-points: 43% CM group vs 3% prescription group (p<0.01)  Drug treatment at 12 months: 17% CM group vs 31% prescription group (p=0.45)  KQ2: 1/67 deaths in contingency, 1 month after study  KQ3: Not reported | Fair |
| **Epstein, 200917**  **RCT**  **USA** | 252  Gender: 52% female  Race/Ethnicity: 66% African American  Unemployed: 18% | Methadone | 20 weeks  Retention: % of participants retained in study through study completion | CM: Vouchers for goods and services provided for submitting opioid-negative urine samples  vs  Non-CM: Vouchers awarded independent of urine screen results on a schedule yoked to the performance of another participant | KQ1: No group differences in retention  Log-rank χ2 = 2.51, df=2, p=0.29  KQ2: Not reported  KQ3: Not reported | Good |
| **Everly,**  **201118**  **RCT**  **USA** | 35  Mean Age: 42.5%  Contingency group:  Gender: 42.5% female  Control group:  Gender: 53% female | Naltrexone injections | 26 weeks  Retention: % of participants who accepted all scheduled naltrexone injections | CM: Access to therapeutic workplace contingent upon acceptance of naltrexone injections  vs  Prescription: Access to therapeutic workplace not contingent upon acceptance of naltrexone injections | KQ1: Received all injections: 66% CM group vs 35% prescription group  χ2 (1) = 4.94*,* p=0.026; HR = 0.32; 95% CI = 0.117 - 0.874  KQ2: Not reported  KQ3: Not reported | Fair |
| **Holtyn,**  **201419**  **RCT**  **USA** | 98  Work reinforcement group:  Gender: 33% female  Race/Ethnicity: 63% African American  Abstinence, methadone, and work reinforcement:  Gender: 45% female  Race/Ethnicity: 73% African American | Methadone | 26 weeks  Retention: % of participants enrolled in MOUD at 30-day assessments | CM: Access to therapeutic workplace contingent upon verified enrollment in outside MOUD program  Non-CM: Access to workplace independent of MOUD enrollment status | KQ1: 30-day retention: 81% CM group vs 82% non-CM group  OR (95% CI) 1.40 (0.40-4.83), p=0.60  KQ2: Not reported  KQ3: Not reported | Fair |
| **Kidorf,**  **201811**  **RCT**  **USA** | 212  (Standard care intervention) vs (Voucher reinforcement intervention) vs (Low threshold intervention):  Mean Age: 40.3(10.9) vs 40.3(10.0) vs 38.8(9.4)  Gender: 54% vs 47% vs 65% male  Race/Ethnicity: 34 vs 43 vs 36% White  Education: 11.2(2.1) vs 11.5 (2.3) vs 11.3 (2.0)  Employed: 6% vs 13% vs 6%  HIV+: 3% vs 6% vs 9% | Methadone | 6-months  Retention: % retained at 90 days and 180 days | Treatment intervention at a syringe exchange program (SEP)  Voucher reinforcement intervention (VRI): SCI supplemented with contingency management - contingent on adherence to daily schedules of dosing and counseling. One time per week based on adherence the prior week. Initial value $12, maximum $174, $30 bonus for 3 weeks of adherence, earnings were exchanged for goods/services from local community  vs  Low threshold intervention (LTI): Participants excluded from adaptive treatment. Only required to attend 1 counseling session/month.  vs  Standard care intervention (SCI): Routine program, evidenced-based adaptive treatment model | KQ1: 90 day retention: 34% VRI vs 35% LTI vs 31% SCI (p=0.28)  180 day retention: 34% VRI vs 37% LTI vs 29% SCI (p=0.36)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Specka, 201320**  **RCT**  **Germany** | 136  Gender: 67% male  Unemployed: 72% | Methadone  Buprenorphine | 26 weeks  Retention: % of participants who completed the study | CM: Received escalating number of take-home dosages of medication contingent upon increasing number of opioid-free urine samples  vs  Treatment as usual (TAU): Received 4 days of medication dosages for 12 consecutive opioid-free weekly urine screens | KQ1: 62.5% CM group vs 64.1% TAU group (p=0.85)  KQ2: Not reported  KQ3: Not reported | Fair |

MOUD= medications for opioid use disorder; SR= systematic review; RCT= randomized controlled trial; LAAM= levo-alpha acetyl methadol; KQ= key question; CM= contingency management; SEP= syringe exchange program; SCI= standard care intervention; VRI= voucher reinforcement intervention; LTI= low threshold intervention; TAU= treatment as usual

Table 4. Published literature on health IT for MOUD

| **Author, Year**  **Study Design**  **Country** | **Number of Participants**  **Participant Characteristics** | **MOUD Medications** | **Timing & Outcome** | **Interventions** | **Results** | **Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- |
| **Marsch, 201421**  **RCT**  **USA** | 160  Mean Age: 40.7 Gender: 25% female Race/Ethnicity: 27.4% Hispanic  Married: 9.4% Unemployed: 46.8% | Methadone | 12 months  Retention: % retained in treatment over duration of treatment | Computer-based education & support  Intervention: 50%/50% in-person/Therapeutic Education System (TES)  vs  Treatment as usual (TAU): MOUD + clinic resources (In-person counseling & group therapy) | KQ1: Retention: 31/80 (39%) intervention group vs 31/80 (39%) TAU group  p=0.56, OR CI (0.5-1.2)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Moore,**  **201822**  **RCT**  **USA** | 82  Treatment arm (n=40):  Mean Age: 43.6 Gender: 60% male Race/Ethnicity:  65% White  Married: 60% Unemployed: 63% | Methadone | 3-months  Retention: % of days of medication adherence | Computer-based education & support  Intervention: Automated, computer-  based, cognitive behavioral therapy (CBT) interactive voice response (IVR) system  vs  TAU: Methadone + clinic resources (In-person counseling & group therapy) | KQ1: 94%  p=0.60  (retention only reported for entire study population, not individual groups)  KQ2: 12 Adverse Events not described (7 of 40 [17%] Intervention, 5 Control of 42 [12%]); 1 Control removed from study due to medical issues  KQ3: Not reported  Greater IVR use, more days abstinent.  IVR group requested continued access to IVR post study.  Qualitative interviews patients reported just knowing resource was available was beneficial. | Poor |
| **Ruetsch,**  **201223**  **RCT**  **USA** | 1426  Participant characteristics not reported | Buprenorphine | 12 months  Retention: Medication taken at the prescribed dose on at least 80% of days (22/28 days) based on participant self-report of the previous 28 days | Computer-based education & support  Intervention:  Here to Help: online educational materials, treatment calendar, peer stories, telephone coaching + MOUD  vs  TAU: MOUD + clinic resources (In-person counseling & group therapy) | KQ1: 55% intervention group vs 56.1% TAU group (p= not reported)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Shi,**  **201924**  **RCT**  **USA** | 20  Mean Age: 18+  Gender: Predominantly male  Race/Ethnicity: Predominantly White  Education: Most completed high school  Employment: “About half” | Buprenorphine | 3-months  Retention: Mean number of days in 12-week protocol | Computer-based education & support  Intervention: Web-based CBT  vs  TAU: MOUD + clinic resources (In-person counseling & group therapy) | KQ1: Mean days in 12-week protocol: 83 days intervention group vs 69 days TAU group (p=0.19)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Eibl,**  **201725**  **Retrospective cohort**  **Entire Province of Canada** | 3733 | Methadone, Buprenorphine | 12-months  Retention: At least 1- year consecutive MOUD | Telehealth  Patients stratified by primary treatment modality:  >75% telehealth  vs.  25-75% mixed  vs.  <25% in-person | KQ1:  50%; aOR 1.27 (1.14-1.41)  47% aOR 1.27 (1.08-1.47)  39% (reference)  KQ2: Not reported  KQ3: Receiving care in Northern clinics was positively associated with retention. Significant associations were also detected for sex, clinic region, age, and peak methadone dose, but not for clinic rurality. | Fair |
| **Weintraub, 201826**  **Retrospective chart review**  **USA** | 177  Mean Age: 35.1 Gender: 89% male  Race/Ethnicity: 82% White  Insurance: 96% Medicaid  Self-reported abstinence at initial evaluation: 72% | Buprenorphine | 3-months  Retention: % retained in treatment | Telehealth  Telehealth (to patient), teleconsult (to provider) not specified; connection of academic medical center to rural treatment center  Patients were detoxified prior to study | KQ1: 57.4%  KQ2: Not reported  KQ3: Not reported | Fair |
| **Zheng,**  **201727**  **Retrospective chart review**  **USA** | 55\*  Mean Age: 37.2 and 34.4  Race/Ethnicity: mostly White  Unemployed: mostly unemployed  \*study n= 100, 55 followed for 12 months | Buprenorphine | 12 months  Retention: % of patients in program at 12 months | Telehealth  Intervention: Telehealth psychiatry  vs  In-person psychiatry | KQ1:  41.7%    35.5%  p = 0.55  KQ2: Not reported  KQ3: Not reported | Fair |

IT= informational technology; MOUD= medications for opioid use disorder; RCT= randomized controlled trial; TES= Therapeutic Education System; TAU= treatment as usual; KQ= key question; CBT= cognitive behavioral therapy; IVR= interactive voice response

Table 5. Published literature on extended-release medication based treatments

| **Author, Year**  **Study Design**  **Country**  **Funder** | **Number of participants**  **Participant characteristics** | **MOUD Medications** | **Timing & Outcome** | **Interventions** | **Results** | **Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- |
| **Tanum, 201728**  **RCT**  **Norway** | 159  Mean Age: 35.1  Gender: 72.3% male  Race/Ethnicity: 89.2% White  IV drug users: 85.5%  Only participants who successfully completed medically supervised withdrawal were randomized into the study | XR NTX monthly injection  Daily SL buprenorphine/ naloxone | 3 months  Retention: number of days until dropout from study medication and by the number of patients completing the study at week 12. | XR NTX monthly injection  vs  Daily SL buprenorphine/ naloxone | KQ1: Retention, mean (SD) time: 69.3 (25.9) XR NTX vs 63.7 (29.9) days daily buprenorphine / naloxone. At 12 weeks 66% participants had attended all scheduled follow-up and taken their medications as prescribed.  KQ2: Serious adverse events not different between the two groups (8.5% vs 4.2%, p=0.33).  10 participants (4 in the XR NTX group and 6 in the buprenorphine/ naloxone group) exited the study due to adverse events:  KQ3: Not reported | Good |
| **Lee, 201829**  **RCT**  **USA** | 570  Age: 18+  Gender: 70.5% male  Race/Ethnicity: 74% White  Heroin Users: 81%  Prescription Opioid Users: 15.5%  Participants were randomized into the study either prior to or following successful completion of medically supervised withdrawal | XR NTX monthly injection  Daily SL buprenorphine/ naloxone | 6 months  Retention: % study participants who completed 6 months of the study | XR NTX monthly injection  vs  Daily SL buprenorphine/ naloxone | KQ1: Retention at 6 months: 96/283 (33.9%) XR NTX vs 115/287 (40%) daily buprenorphine/ naloxone (p value not reported)  KQ2: serious adverse events not different between groups (14% and 11%). 28 overdose events, 18 (64%) in the XR NTX group, including 8 among induction failures and 10 among those who received at least a single XR NTX injection. 5 overdoses were fatal, including 2 in the XR NTX group and 3 in the daily buprenorphine/naloxone group.  KQ3: Not reported | Fair |
| **Sullivan, 201930**  **RCT**  **USA**  **NIDA** | 60  Mean Age: 39.5  Gender: 83.3% male  Race/Ethnicity: 63.3% White  Heroin Users: 26.7% Prescription Opioid Users: 85.0%  Participants were randomized after successfully completing medically supervised opioid withdrawal | XR NTX monthly injection  Daily naltrexone | 6 months  Retention: % study participants who completed 6 months of the study. | XR NTX monthly injection  vs  Daily naltrexone | KQ1: Retention at 6 months: 57.1% XR NTX vs 28.1% daily naltrexone (HR=2.18, 95% CI=1.07, 4.43)  KQ2: 9 serious adverse events, including 5 in the XR NTX and 3 in the daily naltrexone group. 5 participants were from the study which included 1 participant who developed hives after an XR NTX injection.  KQ3: Not reported | Fair |
| **Rosenthal, 201631**  **RCT**  **USA**  **Braeburn Pharmaceuticals** | 177  Age: 18+  Gender: 59.1% male  Race/Ethnicity: 94.9% White,  Heroin Users: 21.0%  Prescription Opioid Users: 74.4% | XR Buprenorphine 6-month implant  Daily SL buprenorphine | 6 months  Retention: % study participants who completed 6 months of the study. | Clinically stable on daily buprenorphine for 6 months before enrollment:  XR Buprenorphine 6-month implant  vs  Daily SL buprenorphine | KQ1: Retention: 81/87 (93.1%) implant vs 84/90 (94.3%) daily buprenorphine (p-value not reported)  KQ2: 5 serious adverse events reported, 3 in the daily buprenorphine and 2 in the buprenorphine implant group. 1 participant in the buprenorphine implant exited the study.  KQ3: Not reported | Good |
| **Lofwall, 201832**  **RCT**  **USA**  **Braeburn Pharmaceuticals**  **University of Kentucky** | 428  Age: 18+  Gender: 61.4% male  Race/Ethnicity: 74.2% White  Heroin Users: 70.8%  Prescription Opioid Users: 29.2% | XR Buprenorphine monthly injection  Daily SL buprenorphine /naloxone | 24 weeks  Retention: % participants retained on the study medication regimen at 24 weeks of treatment | XR Buprenorphine injections (weekly during weeks 1 – 11, monthly during weeks 12 – 24) + daily SL placebo  vs  Placebo injections (weekly during weeks 1 – 11, monthly during weeks 12 – 24) + daily SL buprenorphine/ naloxone | KQ1: Retention: 56.8% XR buprenorphine vs 58.1% daily buprenorphine/naloxone (p-value not reported)  KQ2: 18 participants reported at least 1 serious non-fatal adverse event; which lead to study disenrollment among 3.3% buprenorphine injection and 1.4% daily buprenorphine participants. only 1 serious adverse event was related to the buprenorphine injection. 5 daily buprenorphine/ naloxone participants reported nonfatal overdoses.  KQ3: Not reported | Fair |

MOUD= medications for opioid use disorder; RCT= randomized controlled trial; IV= intravenous; XR= extended-release; NTX= naltrexone; SL= sublingual; KQ= key question; CI= confidence interval; KCL= King’s College London; SLaM= South London and Maudsley; NHS= National Health Service

Table 6. Published literature on psychosocial support interventions

| **Author, Year**  **Study Design**  **Country** | **Number of participants**  **Participant characteristics** | **MOUD Medications** | **Timing & Outcome** | **Interventions** | **Results** | **Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- |
| **Amato,**  **201113**  **SR** | 4319  Age: 18+, average 35, range: 27-45 years  Gender: 73% male  Non-pregnant  Naïve/stable in treatment: varies at individual study level | Methadone  Buprenorphine  Levo-alpha acetyl methadol (LAAM) | Timing variable (6 - 48 weeks)  Retention: # participants in treatment at the end of the study | Any psychosocial / behavioral + any agonist maintenance treatment  vs  Standard agonist treatment | KQ1: Results do not show benefit for retention in treatment (26 studies, 2582 participants)  KQ2: Not reported  KQ3: Not reported | Quality of included studies for outcome of retention assessed as ‘high’ using GRADE |
| **Christensen, 201433**  **RCT**  **USA** | 170  Mean Age: 20-63  Non-pregnant  Not incarcerated  Naïve/stable in treatment: naïve, but unclear of if any patients had previous MOUD | Buprenorphine induction  Buprenorphine-naloxone tablet maintenance | 3-months  Retention: % participants completed all 3-months | Web-based community reinforcement approach (CRA) + contingency management (CM) + minimal therapist counseling + MOUD  vs  CM + minimal therapist counseling + MOUD | KQ1: Retention: 80% CRA+CM vs 64% CM+ counselling  OR =2.30 (1.15, 4.60)  KQ2: Not reported  KQ3: when stratified by prior treatment the hazard of dropping out for CM-alone participants was 6.57 times (χ2(1) = 9.01, p=0.003) that for CRA+ participants. For treatment-naïve participants, the hazard for CM-alone participants was 1.15 times (χ2(1) = 0.13, p=0.718) that for CRA+ participants | Poor |
| **Fiellin, 201334**  **RCT**  **USA** | 141  Mean Age: 33  Gender: <70% male  Race/Ethnicity: <80% White  Prescription drug use: 36%  Prior detox attempt: 49% | Buprenorphine  Naloxone | 6 months  Retention: % participants completed all 6 months | Physician management + cognitive behavioral therapy (CBT)  vs  Physician management alone | KQ1: Retention: 39% CBT vs 45% physician management alone  (p=0.43)  KQ2: Not reported  KQ3: Not reported | Good |
| **Jaffray, 201435**  **RCT**  **Scotland** | 542  Mean Age: 32  Gender: 64% male  Unemployed: 91%  Naïve/stable in treatment: "initiated in the last 24 months" - stable | Methadone | 6 months in study; baseline mean 9 months in methadone  Retention: % participants still receiving treatment at 6 months | Motivational interviewing + resource pack (with area-specific information on available services for pharmacists) + normal practice methadone treatment  vs  Normal practice methadone treatment | KQ1: Retention:  88% intervention vs 81% usual care  (Adjusted  p=0.34)  OR = 1.76 (0.55, 5.64)  KQ2: Physical and psychological health of the intervention group significantly deteriorated between baseline and follow-up, whilst the control group remained relatively unchanged  KQ3: Not reported | Poor |
| **Marsden, 201936**  **RCT**  **UK** | 273  Age: 18+  All participants were treatment resistant (i.e., had used illicit or non-prescribed opioids or cocaine on one or more days in the past 28 days at study screening, which was verified by positive urine drug screen) | Buprenorphine  Methadone | 18 weeks  Retention: # days from randomization to the endpoint or exit | Personalized psychosocial intervention + treatment as usual  vs  Treatment as usual (TAU) | KQ1: No between-group difference in retention in either  unadjusted or adjusted analyses.  KQ2: The number of adverse events was similar between groups, and no severe adverse events in either group were judged to be treatment related.  KQ3: Not reported | Fair |
| **Mitchell, 201337**  **RCT**  **USA** | 300  Age: 18+  Race/Ethnicity: African American population  Newly admitted to buprenorphine treatment at one of the participating treatment programs | Buprenorphine | 6 months  Retention: % participants in buprenorphine treatment at 6 months | Intensive outpatient (IOP)  vs  Standard outpatient (OP) | KQ1: Retention: 56.6% IOP vs 58.7% OP  KQ2: Controlling for # of days in treatment, greater counseling exposure was associated with significantly less improvement for three outcomes: days of heroin use, days of cocaine use, and days of criminal activity (however authors suggest the association is not causal)  KQ3: Not reported | Poor |
| **Schwartz, 201238**  **RCT**  **USA** | 230  Mean Age: 43.2  Gender: 70% male  Race/Ethnicity: 77.4% African American  Married: 13.5%  Employed During 30 Days Prior to Baseline: 32.6%  Non-pregnant  Opioid dependent for 1 year+ | Methadone | 12 months  Retention: % participants retained in original MTP | Interim methadone (IM; supervised methadone with emergency counseling only for the first 4 months of treatment)  vs  Restored methadone (RM; routine counseling with smaller case loads  vs  Standard methadone (SM; with routine counseling) | KQ1: Retention: 60.6% IM vs 37% RM vs 54.8% SM  χ2(2) = 4.8  (p>0.05)  KQ2: Not reported  KQ3: Not reported | Fair |
| **Stein,**  **201539**  **RCT**  **USA** | 49  Mean Age: 41  Gender: 65.3% male  Race/Ethnicity: 85.7% Non-Latino White  Reported they had ever received prescribed buprenorphine: 28.6% | Buprenorphine-naloxone induction  Buprenorphine maintenance | 3-months  Retention: % participants retained in treatment | DT (distress tolerance) intervention + buprenorphine-naloxone induction then 3-months buprenorphine maintenance  vs  HE (health education) control + buprenorphine-naloxone induction then 3-months buprenorphine maintenance | KQ1: Retention: 75% DT vs 76% control  Between group mean difference (95% CI) −1.0 (−25.1; 23.1)  KQ2: Not reported  KQ3: Not reported | Good |
| **Sullivan, 2015**  **RCT**  **USA** | 125  Mean Age: 38  Gender: 21% female  Race/Ethnicity: 43% White  Heavy use (>6 bags heroin/day): 34% | XR Naltrexone  Oral Naltrexone | 6 months  Retention: % of participants retained in treatment | Behavioral Naltrexone Therapy (BNT) + standard (oral and injectable naltrexone) treatment  vs  Compliance Enhancement (CE) + standard (oral and injectable naltrexone) treatment  vs  Behavioral Naltrexone Therapy (BNT) + placebo injection and oral naltrexone  vs  Compliance Enhancement (CE) + placebo injection and oral naltrexone | KQ1: Retention: 47.8% BNT + standard Naltrexone vs 16.7% CE +standard naltrexone vs 23.8% BNT + placebo vs 14.3% CE+placebo  KQ2: Not reported  KQ3: For low-severity opioid users, retention was highest (60% at 6 months) in Behavioral Naltrexone Therapy with a single administration of injection naltrexone (XR-naltrexone) post-detoxification.  For high-severity opioid users, BNT-XR-naltrexone + oral naltrexone did not perform as well. | Fair |
| **Weiss,**  **201140**  **RCT**  **UK** | 653  Mean Age: 32.9  Gender: 38% female  Race/Ethnicity: 91.5% White  Unmarried: 49.2%  Employment: 63.8% FTE  Met DSM IV criteria for current opioid dependence on prescription opioids | Buprenorphine-naloxone | Phase 1: 4 weeks (2 week stabilization, 2 week taper)  Retention: # of SMM (standard medical management) visits  Phase 2: 16 weeks (12 week treatment, 4 week taper) | SMM + ODC (opioid drug counseling)  vs  SMM alone | KQ1: Mean (SD) visits Phase 1: 4.4 (1.5) ODC vs  4.5 (1.5) SMM alone  (z=1.24, p=0.39)  Phase 2:  14.1 (4.4) ODC vs 13.9 (4.0) SMM alone  (z=0.86, p=0.21)  KQ2: Psychiatric symptoms were the most common serious adverse events (7 of 36), particularly depression leading to hospitalization (n=5); all of these occurred soon after completion of the Phase 1 (n=2) or Phase 2 (n=3) taper.  KQ3: A history of ever using heroin was associated with lower Phase 2 success rates while taking buprenorphine-naloxone  Chronic pain at baseline was not related to outcomes either in Phase 1 or during Phase 2 while taking buprenorphine-naloxone | Fair |

MOUD= medications for opioid use disorder; SR= systematic review; LAAM= levo-alpha acetyl methadol; KQ= key question; GRADE= Grading of Recommendations Assessment, Development and Evaluation; RCT= randomized controlled trial; CRA= community reinforcement approach; CM= contingency management; CBT= cognitive behavioral therapy; TAU= treatment as usual; IOP= Intensive outpatient; OP= standard outpatient; MTP= methadone treatment program; IM= interim methadone; RM= restored methadone; SM= standard methadone; DT= distress tolerance; HE= health education; XR= extended-release; BNT= Behavioral Naltrexone Therapy; CE= compliance enhancement; SMM= standard medical management; ODC= opioid drug counseling; SD= standard deviation

Table 7. Quality ratings for care settings, services, logistical support

| **Author, Year** | **Randomization** | **Allocation Concealment** | **Groups Similar at Baseline** | **Blinded Outcome Assessors** | **Blinded Care Provider** | **Blinded Patient** | **Intention-To-Treat (ITT) Analysis** | **Acceptable Levels of Overall Attrition** | **Avoidance of Selective Outcomes Reporting** | **Final Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pre-Release MOUD Models** | | | | | | | | | | |
| **Friedmann, 20182** | Unclear | Unclear | Yes | No | No | No | Yes | Yes | No | Poor |
| **Gordon, 20173** | Yes | Yes | Yes | Unclear | No | No | Yes | Yes | Yes | Fair |
| **MOUD Integrated into Primary Care** | | | | | | | | | | |
| **Brooner, 20134** | Yes | Unclear | Yes | Unclear | No | No | Yes | Unclear | Yes | Fair |
| **Carrieri, 20145** | Yes | Unclear | Yes | Unclear | No | No | Yes | Yes | Yes | Fair |
| **Miotto,**  **20126** | Yes | Yes | No | No | No | No | Yes | Unclear | Yes | Fair |
| **MOUD in ED/Hospital Settings** | | | | | | | | | | |
| **Liebschutz,**  **20147** | Yes | Unclear | Yes | No | No | No | Yes | Yes | Yes | Fair |
| **D’Onofrio8** | Yes | Yes | Yes | Unclear | No | No | No | Yes | Yes | Fair |
| **MOUD in Community Settings/Social Services** | | | | | | | | | | |
| **Schwartz,**  **20179** | Yes | Yes | Yes | No | No | No | No | Yes | Yes | Good |
| **Beattie,**  **201610** | Yes | Yes | Yes | No | No | No | Yes | Yes | Yes | Fair |
| **Kidorf,**  **201811** | Yes | Unclear | Unclear | Unclear | No | No | Yes | Yes | No | Fair |
| **Parpouchi,**  **201812** | Yes | Unclear | Yes | Unclear | No | No | No | Unclear | Yes | Fair |

Table 8. Quality ratings for contingency management

| **Author, Year** | **Randomization** | **Allocation Concealment** | **Groups Similar at Baseline** | **Blinded Outcome Assessors** | **Blinded Care Provider** | **Blinded Patient** | **Intention-To-Treat (ITT) Analysis** | **Acceptable Levels of Overall Attrition** | **Avoidance of Selective Outcomes Reporting** | **Final Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DeFulio, 201214** | Yes | Unclear | Yes | Unclear | No | No | Yes | Yes | Yes | Fair |
| **Dunn,**  **201315** | Yes | Unclear | Yes | Unclear | No | No | Yes | Yes | Yes | Fair |
| **Dunn,**  **201516** | Yes | Unclear | No | Unclear | No | No | Yes | Yes | Yes | Fair |
| **Epstein,**  **200917** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Good |
| **Everly,**  **201118** | Yes | Unclear | Yes | Unclear | Unclear | No | Yes | Yes | Yes | Fair |
| **Holtyn,**  **201419** | Yes | No | Unclear | Unclear | No | No | Yes | Yes | No | Fair |
| **Kidorf,**  **2018 11** | Yes | Unclear | Unclear | Unclear | No | No | Yes | Yes | No | Fair |
| **Specka,**  **201320** | Unclear | Unclear | Unclear | No | No | No | Yes | Yes | Yes | Fair |

Table 9. Quality ratings for health IT

| **Author, Year** | **Randomization** | **Allocation Concealment** | **Groups Similar at Baseline** | **Blinded Outcome Assessors** | **Blinded Care Provider** | **Blinded Patient** | **Intention-To-Treat (ITT) Analysis** | **Acceptable Levels of Overall Attrition** | **Avoidance of Selective Outcomes Reporting** | **Final Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Marsch, 201421** | Yes | No | Yes | Yes | No | No | Yes | Yes | Unclear | Fair |
| **Moore,**  **201922** | Unclear | No | Unclear | No | No | No | Yes | Yes | Unclear | Poor |
| **Reutsch, 201223** | Yes | Unclear | Yes | Unclear | Unclear | Unclear | Unclear | Yes | Yes | Fair |
| **Shi,**  **201924** | Yes | Unclear | Yes | Unclear | No | No | Yes | Yes | Yes | Fair |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cohort studies** | | | | | | | | | | |
| **Author, Year** | **Randomization** | **Allocation Concealment** | **Groups Similar at Baseline** | **Blinded Outcome Assessors** | **Blinded Care Provider** | **Blinded Patient** | **Intention-To-Treat (ITT) Analysis** | **Acceptable Levels of Overall Attrition** | **Avoidance of Selective Outcomes Reporting** | **Final Quality Rating** |
| **Eibl,**  **201725** | N/A | Yes | Yes | No | No | No | No | Unclear | Yes | Fair |
| **Weintraub, 201826** | N/A | Yes | Yes | No | No | No | No | Unclear | Yes | Fair |
| **Zheng,**  **201727** | N/A | Yes | Yes | No | No | No | Yes | Unclear | Yes | Fair |

Table 10. Quality ratings for extended-release medication based treatments

| **Author, Year** | **Randomization** | **Allocation Concealment** | **Groups Similar at Baseline** | **Blinded Outcome Assessors** | **Blinded Care Provider** | **Blinded Patient** | **Intention-To-Treat (ITT) Analysis** | **Acceptable Levels of Overall Attrition** | **Avoidance of Selective Outcomes Reporting** | **Final Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Tanum, 201728** | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Good |
| **Lee,**  **201829** | Yes | Yes | Yes | Unclear | Unclear | Unclear | Yes | No | Yes | Fair |
| **Sullivan, 201930** | Yes | Unclear | Yes | No | No | No | Yes | Yes | Yes | Fair |
| **Rosenthal, 201631** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Good |
| **Lofwall, 201832** | Yes | Yes | Yes | Unclear | Unclear | Unclear | Yes | No | Yes | Fair |

Table 11. Quality ratings for psychosocial

| **Author,**  **Year** | **Randomization** | **Allocation Concealment** | **Groups Similar at Baseline** | **Blinded Outcome Assessors** | **Blinded Care Provider** | **Blinded Patient** | **Intention-To-Treat (ITT) Analysis** | **Acceptable Levels of Overall Attrition** | **Avoidance of Selective Outcomes Reporting** | **Final Quality Rating** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Christensen, 201433** | No | No | No | No | No | No | Unclear | No | Yes | Poor |
| **Fiellin,**  **201334** | Yes | Yes | Yes | Unclear | No | No | Yes | Yes | Yes | Good |
| **Jaffray,**  **201435** | Unclear | Unclear | Yes | Unclear | No | Yes | Yes | No | Yes | Poor |
| **Marsden, 201936** | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Fair |
| **Mitchell, 201337** | Yes | Yes | No | Unclear | No | No | Yes | No | Unclear | Poor |
| **Schwartz, 201238** | Yes | Unclear | Yes | Unclear | No | No | Yes | No | Yes | Fair |
| **Stein,**  **201539** | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Good |
| **Sullivan, 2015** | Unclear | Yes | Yes | Unclear | No | Yes | Unclear | No | Yes | Fair |
| **Weiss,**  **201140** | Unclear | Unclear | Yes | No | No | No | Yes | Yes | Yes | Fair |

1. Hedrich D, Alves P, Farrell M, Stover H, Moller L, Mayet S. The effectiveness of opioid maintenance treatment in prison settings: a systematic review. *Addiction.* 2012;107(3):501-517.

2. Friedmann PD, Wilson D, Hoskinson R, Jr., Poshkus M, Clarke JG. Initiation of extended release naltrexone (XR-NTX) for opioid use disorder prior to release from prison. *J Subst Abuse Treat.* 2018;85:45-48.

3. Gordon MS, Kinlock TW, Schwartz RP, O'Grady KE, Fitzgerald TT, Vocci FJ. A randomized clinical trial of buprenorphine for prisoners: Findings at 12-months post-release. *Drug and alcohol dependence.* 2017;172:34-42.

4. Brooner RK, Kidorf MS, King VL, et al. Managing psychiatric comorbidity within versus outside of methadone treatment settings: a randomized and controlled evaluation. *Addiction.* 2013;108(11):1942-1951.

5. Carrieri PM, Michel L, Lions C, et al. Methadone induction in primary care for opioid dependence: a pragmatic randomized trial (ANRS Methaville). *PLoS ONE [Electronic Resource].* 2014;9(11):e112328.

6. Miotto K, Hillhouse M, Donovick R, et al. Comparison of buprenorphine treatment for opioid dependence in 3 settings. *J Addict Med.* 2012;6(1):68-76.

7. Liebschutz JM, Crooks D, Herman D, et al. Buprenorphine treatment for hospitalized, opioid-dependent patients: a randomized clinical trial. *JAMA Intern Med.* 2014;174(8):1369-1376.

8. D'Onofrio G, Chawarski MC, O'Connor PG, et al. Emergency Department-Initiated Buprenorphine for Opioid Dependence with Continuation in Primary Care: Outcomes During and After Intervention. *Journal of General Internal Medicine.* 2017;32(6):660-666.

9. Schwartz RP, Kelly SM, Mitchell SG, et al. Patient-centered methadone treatment: a randomized clinical trial. *Addiction.* 2017;112(3):454-464.

10. Beattie A, Marques EM, Barber M, et al. Script in a Day intervention for individuals who are injecting opioids: a feasibility randomized control trial. *J Public Health (Oxf).* 2015;38(4):712-721.

11. Kidorf M, Brooner RK, Leoutsakos JM, Peirce J. Treatment initiation strategies for syringe exchange referrals to methadone maintenance: A randomized clinical trial. *Drug and alcohol dependence.* 2018;187:343-350.

12. Parpouchi M, Moniruzzaman A, Rezansoff SN, Russolillo A, Somers JM. The effect of Housing First on adherence to methadone maintenance treatment. *The International journal on drug policy.* 2018;56:73-80.

13. Amato L, Minozzi S, Davoli M, Vecchi S. Psychosocial combined with agonist maintenance treatments versus agonist maintenance treatments alone for treatment of opioid dependence. *Cochrane Database Syst Rev.* 2011(10):CD004147.

14. DeFulio A, Everly JJ, Leoutsakos JM, et al. Employment-based reinforcement of adherence to an FDA approved extended release formulation of naltrexone in opioid-dependent adults: a randomized controlled trial. *Drug and alcohol dependence.* 2012;120(1-3):48-54.

15. Dunn KE, Defulio A, Everly JJ, et al. Employment-based reinforcement of adherence to oral naltrexone treatment in unemployed injection drug users. *Exp Clin Psychopharmacol.* 2013;21(1):74-83.

16. Dunn K, DeFulio A, Everly JJ, et al. Employment-based reinforcement of adherence to oral naltrexone in unemployed injection drug users: 12-month outcomes. *Psychology of addictive behaviors : journal of the Society of Psychologists in Addictive Behaviors.* 2015;29(2):270-276.

17. Epstein DH, Schmittner J, Umbricht A, Schroeder JR, Moolchan ET, Preston KL. Promoting abstinence from cocaine and heroin with a methadone dose increase and a novel contingency. *Drug and alcohol dependence.* 2009;101(1-2):92-100.

18. Everly JJ, DeFulio A, Koffarnus MN, et al. Employment-based reinforcement of adherence to depot naltrexone in unemployed opioid-dependent adults: a randomized controlled trial. *Addiction.* 2011;106(7):1309-1318.

19. Holtyn AF, Koffarnus MN, DeFulio A, et al. The therapeutic workplace to promote treatment engagement and drug abstinence in out-of-treatment injection drug users: a randomized controlled trial. *Prev Med.* 2014;68:62-70.

20. Specka M, Boning A, Kluwig J, et al. Can reinforcement-based interventions to reduce drug use successfully be adapted to routine opioid maintenance treatment? *Ann Ist Super Sanita.* 2013;49(4):358-364.

21. Marsch LA, Guarino H, Acosta M, et al. Web-based behavioral treatment for substance use disorders as a partial replacement of standard methadone maintenance treatment. *J Subst Abuse Treat.* 2014;46(1):43-51.

22. Moore BA, Buono FD, Lloyd DP, Printz DMB, Fiellin DA, Barry DT. A randomized clinical trial of the Recovery Line among methadone treatment patients with ongoing illicit drug use. *J Subst Abuse Treat.* 2019;97:68-74.

23. Ruetsch C, Tkacz J, McPherson TL, Cacciola J. The effect of telephonic patient support on treatment for opioid dependence: outcomes at one year follow-up. *Addictive Behaviors.* 2012;37(5):686-689.

24. Shi JM, Henry SP, Dwy SL, Orazietti SA, Carroll KM. Randomized pilot trial of Web-based cognitive-behavioral therapy adapted for use in office-based buprenorphine maintenance. *Subst Abuse.* 2019:1-4.

25. Eibl JK, Gauthier G, Pellegrini D, et al. The effectiveness of telemedicine-delivered opioid agonist therapy in a supervised clinical setting. *Drug and alcohol dependence.* 2017;176:133-138.

26. Weintraub E, Greenblatt AD, Chang J, Himelhoch S, Welsh C. Expanding access to buprenorphine treatment in rural areas with the use of telemedicine. *The American journal on addictions.* 2018;27(8):612-617.

27. Zheng W, Nickasch M, Lander L, et al. Treatment Outcome Comparison Between Telepsychiatry and Face-to-face Buprenorphine Medication-assisted Treatment for Opioid Use Disorder: A 2-Year Retrospective Data Analysis. *J Addict Med.* 2017;11(2):138-144.

28. Tanum L, Solli KK, Latif ZE, et al. Effectiveness of Injectable Extended-Release Naltrexone vs Daily Buprenorphine-Naloxone for Opioid Dependence: A Randomized Clinical Noninferiority Trial. *JAMA Psychiatry.* 2017;74(12):1197-1205.

29. Lee JD, Nunes EV, Jr., Novo P, et al. Comparative effectiveness of extended-release naltrexone versus buprenorphine-naloxone for opioid relapse prevention (X:BOT): a multicentre, open-label, randomised controlled trial. *Lancet.* 2018;391(10118):309-318.

30. Sullivan MA, Bisaga A, Pavlicova M, et al. A Randomized Trial Comparing Extended-Release Injectable Suspension and Oral Naltrexone, Both Combined With Behavioral Therapy, for the Treatment of Opioid Use Disorder. *Am J Psychiatry.* 2019;176(2):129-137.

31. Rosenthal RN, Lofwall MR, Kim S, et al. Effect of Buprenorphine Implants on Illicit Opioid Use Among Abstinent Adults With Opioid Dependence Treated With Sublingual Buprenorphine: A Randomized Clinical Trial. *JAMA.* 2016;316(3):282-290.

32. Lofwall MR, Walsh SL, Nunes EV, et al. Weekly and Monthly Subcutaneous Buprenorphine Depot Formulations vs Daily Sublingual Buprenorphine With Naloxone for Treatment of Opioid Use Disorder: A Randomized Clinical Trial. *JAMA Intern Med.* 2018;178(6):764-773.

33. Christensen DR, Landes RD, Jackson L, et al. Adding an Internet-delivered treatment to an efficacious treatment package for opioid dependence. *J Consult Clin Psychol.* 2014;82(6):964-972.

34. Fiellin DA, Barry DT, Sullivan LE, et al. A randomized trial of cognitive behavioral therapy in primary care-based buprenorphine. *Am J Med.* 2013;126(1):74.e11-77.

35. Jaffray M, Matheson C, Bond CM, et al. Does training in motivational interviewing for community pharmacists improve outcomes for methadone patients? A cluster randomised controlled trial. *The International journal of pharmacy practice.* 2014;22(1):4-12.

36. Marsden J, Stillwell G, James K, et al. Efficacy and cost-effectiveness of an adjunctive personalised psychosocial intervention in treatment-resistant maintenance opioid agonist therapy: a pragmatic, open-label, randomised controlled trial. *Lancet Psychiatry.* 2019;6(5):391-402.

37. Mitchell SG, Gryczynski J, Schwartz RP, O'Grady KE, Olsen YK, Jaffe JH. A randomized trial of intensive outpatient (IOP) vs. standard outpatient (OP) buprenorphine treatment for African Americans. *Drug and alcohol dependence.* 2013;128(3):222-229.

38. Schwartz RP, Kelly SM, O'Grady KE, Gandhi D, Jaffe JH. Randomized trial of standard methadone treatment compared to initiating methadone without counseling: 12-month findings. *Addiction.* 2012;107(5):943-952.

39. Stein MD, Herman DS, Moitra E, et al. A preliminary randomized controlled trial of a distress tolerance treatment for opioid dependent persons initiating buprenorphine. *Drug and alcohol dependence.* 2015;147:243-250.

40. Weiss RD, Potter JS, Fiellin DA, et al. Adjunctive counseling during brief and extended buprenorphine-naloxone treatment for prescription opioid dependence: a 2-phase randomized controlled trial. *Arch Gen Psychiatry.* 2011;68(12):1238-1246.