Collaborative Care for Opioid and Alcohol Use Disorders in Primary Care
The SUMMIT Randomized Clinical Trial

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**IMPORTANCE** Primary care offers an important and underutilized setting to deliver treatment for opioid and/or alcohol use disorders (OAUD). Collaborative care (CC) is effective but has not been tested for OAUD.

**OBJECTIVE** To determine whether CC for OAUD improves delivery of evidence-based treatments for OAUD and increases self-reported abstinence compared with usual primary care.

**DESIGN, SETTING, AND PARTICIPANTS** A randomized clinical trial of 377 primary care patients with OAUD was conducted in 2 clinics in a federally qualified health center. Participants were recruited from June 3, 2014, to January 15, 2016, and followed for 6 months.

**INTERVENTIONS** Of the 377 participants, 187 were randomized to CC and 190 were randomized to usual care; 77 (20.4%) of the participants were female, of whom 39 (20.9%) were randomized to CC and 38 (20.0%) were randomized to UC. The mean (SD) age of all respondents at baseline was 42 (12.0) years, 41 (11.7) years for the CC group, and 43 (12.2) years for the UC group. Collaborative care was a system-level intervention, designed to increase the delivery of either a 6-session brief psychotherapy treatment and/or medication-assisted treatment with either sublingual buprenorphine/naloxone for opioid use disorders or long-acting injectable naltrexone for alcohol use disorders. Usual care participants were told that the clinic provided OAUD treatment and given a number for appointment scheduling and list of community referrals.

**MAIN OUTCOMES AND MEASURES** The primary outcomes were use of any evidence-based treatment for OAUD and self-reported abstinence from opioids or alcohol at 6 months. The secondary outcomes included the Healthcare Effectiveness Data and Information Set (HEDIS) initiation and engagement measures, abstinence from other substances, heavy drinking, health-related quality of life, and consequences from OAUD.

**RESULTS** At 6 months, the proportion of participants who received any OAUD treatment was higher in the CC group compared with usual care (73 [39.0%] vs 32 [16.8%]; logistic model adjusted OR, 3.97; 95% CI, 2.32-6.79; \( P < .001 \)). A higher proportion of CC participants reported abstinence from opioids or alcohol at 6 months (32.8% vs 22.3%); after linear probability model adjustment for covariates (\( \beta = 0.12; 95\% \text{ CI}, 0.01-0.23; P = .03 \)). In secondary analyses, the proportion meeting the HEDIS initiation and engagement measures was also higher among CC participants (initiation, 31.6% vs 13.7%; adjusted OR, 3.54; 95% CI, 2.02-6.20; \( P < .001 \); engagement, 15.5% vs 4.2%; adjusted OR, 5.89; 95% CI, 2.43-14.32; \( P < .001 \)) as was abstinence from opioids, cocaine, methamphetamine, marijuana, and any alcohol (26.3% vs 15.6%; effect estimate, \( \beta = 0.13; 95\% \text{ CI}, 0.03-0.23; P = .01 \)).

**CONCLUSIONS AND RELEVANCE** Among adults with OAUD in primary care, the SUMMIT collaborative care intervention resulted in significantly more access to treatment and abstinence from alcohol and drugs at 6 months, than usual care.

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Mortality rates are rising from increases in drug overdoses, suicides, and alcohol-related liver disease, yet substance use disorders (SUDs) continue to be underidentified and undertreated.\textsuperscript{2-6} The consequences of this unmet need are great, including increased risk of disease, injury, disability and death, and large social and health care costs.\textsuperscript{7-10} Opioid and alcohol use disorders (OAUD) are of particular concern owing to their high rates of morbidity and mortality\textsuperscript{11-14} and the increasing prevalence of prescription opioid misuse.\textsuperscript{15} Research supports the effectiveness of treatment for OAUD\textsuperscript{16-20} but few individuals receive treatment. Addressing this need has numerous potential benefits.\textsuperscript{21}

Although treatment in specialty settings is important for individuals with severe dependence, limited availability and stigma mean that specialty care alone is insufficient to address treatment needs.\textsuperscript{22-24} Primary care offers an important and underutilized setting for OAUD treatment. Recent federal legislation\textsuperscript{25,26} has increased coverage for SUD treatment and the prevalence of OAUD is high in primary care.\textsuperscript{27,28} Opioid and alcohol use disorders have standards for care and, unlike other SUDs, can be treated with medications, making them appropriate for treatment in primary care.\textsuperscript{16-20}

Collaborative care (CC) is an effective strategy for increasing the delivery of evidence-based treatment and improving outcomes,\textsuperscript{27} but, to our knowledge, has not been tested for OAUD. A previous trial failed to find an effect of chronic care management on SUD outcomes.\textsuperscript{30} Collaborative care is based on principles of the chronic care model\textsuperscript{31,32} and involves integrating behavioral health into primary care. We conducted a randomized clinical trial to determine whether a community health clinic-based CC intervention would improve patient use of evidence-based treatments for OAUD and increase self-reported abstinence. We hypothesized that patients randomized to the CC condition\textsuperscript{33} would have: (1) increased use of a 6-session brief psychotherapy treatment (BT) based on motivational interviewing and cognitive behavioral therapy approaches\textsuperscript{34} and/or medication-assisted treatment (MAT) with either sublingual buprenorphine/naloxone (BUP/NX) for opioid use disorders or long-acting injectable naltrexone (XR-NTX) for alcohol use disorders\textsuperscript{35}; and (2) increased past-30-day abstinence from opioids or alcohol at 6 months.

### Methods

#### Study Design

The Substance Use Motivation and Medication Integrated Treatment (SUMMIT) study was a randomized controlled trial comparing the effect of CC vs usual care on primary care-based OAUD treatment utilization and self-reported abstinence. The study was approved by the RAND institutional review board on April 26, 2012. See the Supplement for the Trial Protocol.

#### Participants

We partnered with a multisite Federally Qualified Health Center (FQHC)\textsuperscript{36} located in Los Angeles, California that provides on-site behavioral health care for depression and anxiety disorders. Of 114 512 patients seen each year, 58% are of Hispanic origin, and 11% are African-American; clinicians include internists, family practitioners, physician assistants, and nurse practitioners. Participants were recruited between June 3, 2014 and January 15, 2016 from the FQHC’s 2 largest clinical sites. During the study’s design, a power analysis determined that a sample of 400 participants would allow estimation of small to medium effect sizes.

All patients attending a primary care visit with a clinician were screened by a medical assistant for substance use in the past 3 months using a 3-question screener based on the National Institute on Drug Abuse (NIDA) quick screen.\textsuperscript{37} Consenting patients who screened positive for risky use were referred for assessment by the research team. Inclusion criteria were (1) age 18 years or older; (2) probable OAUD diagnosis based on the NIDA-modified Alcohol, Smoking and Substance Involvement Screening Test (ASSIST); (3) English or Spanish-speaking; (4) willing to switch therapists if already receiving therapy at the clinic. Exclusion criteria were (1) marked functional impairment from bipolar disorder or schizophrenia\textsuperscript{38,39}; (2) current abstinence from alcohol and/or opioids in the previous 30 days; and (3) current substance use treatment. Participants gave written informed consent and were compensated for research activities ($5 for eligibility screener, $50 for baseline assessment, $50 for follow-up assessment).

#### Assessment at Baseline

The baseline interview assessed demographics; homeless status; Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition) diagnosis of alcohol, heroin, and prescription opioid abuse or dependence using the Comprehensive International Diagnostic Interview (CIDI), version 3.0,\textsuperscript{40,41} past 30-day use of alcohol and opioids using the Timeline Follow-back\textsuperscript{42}; 30-day use of methamphetamine, cocaine, marijuana, and other drugs; typical number of drinks per drinking day in past 12 months; heavy drinking days (defined as 4 or more ethanol drinks in a day for women and 5 or more for men); consequences of alcohol or opioid use using the Short Inventory of Problems Alcohol and Drugs (SIP-AD)\textsuperscript{43,44}; range 0-15); depression symptoms using the Patient Health Questionnaire-8 (PHQ-8)\textsuperscript{45,46}; range 0-24); health-related quality of life (HROQ-15); employment status; opportunity for randomized assignment; and the number of alcohol and opioid use treatment-initiation events. Patients were also asked if they received the following treatments in the previous 30 days for alcohol and/or opioids: (1) either sublingual buprenorphine/naloxone (BUP/NX) for opioid use disorders or long-acting injectable naltrexone (XR-NTX) for alcohol use disorders\textsuperscript{35}; and (2) increased past-30-day abstinence from opioids or alcohol at 6 months.

### Key Points

**Question** Does collaborative care for opioid and alcohol use disorders increase treatment use and self-reported abstinence compared with usual primary care?

**Findings** Results from this randomized clinical trial found that, relative to usual care, the collaborative care intervention increased both the proportion of primary care patients receiving evidence-based treatment for opioid and alcohol use disorders and the number achieving abstinence from opioids or alcohol use at 6 months.

**Meaning** Effective treatment for opioid and alcohol use disorders can be integrated into primary care using a collaborative care intervention and results in improved patient outcomes.
life using the SF-12 Survey (SF-12 mental component summary [MCS] and physical component summary [PCS] scores; range of 0-100); emergency department or overnight hospital stay in past 90 days; and self-reported receipt of lifetime and past year SUD treatment.

Randomization Procedures
We used an R software (version 3, R Project) random number generator to randomly assign eligible participants to either CC or usual care. We used a concealed randomization protocol where neither participant nor researcher was aware of the randomization until after the baseline interview. None of the participants or clinicians was blinded to treatment allocation after randomization.

Participant Assessment at Follow-up
A follow-up assessment using a subset of questions from baseline was conducted by telephone 6 months after the baseline interview. Interviewers were blinded to treatment allocation. The last participant follow-up interview was conducted in September, 2016.

Collaborative Care and Usual Care
The CC intervention included a population-based management approach, measurement-based care, and integration of addiction expertise through a RAND-based clinical psychologist affiliated with the Motivational Interviewing Network of Trainers. Care coordinators met with patients who had positive screening results and who were randomized to CC to assess motivation and encourage patients to meet with a therapist for evaluation and treatment planning. All CC patients were entered into a registry that tracked treatment progress and prompted care coordinators to reach out to patients with missed visits. Care coordinators conducted regular assessments of substance use; results were entered into the registry and reviewed during team meetings. Participants in usual care were told by the research team that the clinic provided OAUD treatment, and given a number for appointment scheduling and list of community referrals. They did not receive any additional outreach or contact.

The 2 clinical sites employed 7 therapists who had counseling or social work masters’ degrees. None had expertise in addiction treatment. All therapists received a 1-hour overview of the BT manuals; 5 were randomized to the CC condition and received an additional 2 days of BT training. Care coordinators had a high school degree and received 2 days of motivational interviewing training; each had worked at the clinic for more than 15 years. Clinicians were not randomized; all 28 were offered MAT training; 24 received XR-NTX training and 18 received training on BUP/NX (7 nonphysicians were not eligible to be waivered and 3 physicians were not trained). Twelve clinicians received their Drug Enforcement Agency waiver to prescribe BUP/NX. Patients who wanted MAT but whose clinician had not been trained or who were ineligible were referred to a waivered clinician. All clinicians were employed by the FQHC; pharmacotherapy consultation was provided by a board-certified addiction medicine physician affiliated with a local academic medical center. Weekly team meetings and group supervision for the care coordinators and therapists in the CC condition were led by the clinical psychologist. All BT sessions were audiotaped and uploaded to a secure site for review during clinical supervision.

Outcomes
There were 2 primary outcomes: use of any evidence-based OAUD treatment (BT or MAT) during the 6-month study period, and self-reported 30-day abstinence from all opioids or any alcohol at 6 months. The BT and MAT visit data were obtained from electronic medical record administrative files; XR-NTX use data were obtained from a pharmacy log; and BUP/NX use data were obtained from medical chart review of electronic medical record notes; we were unable to confirm whether patients filled the BUP/NX prescriptions. Visit data from administrative files were cross-referenced with medical chart review data for all patients and BT audio files for accuracy. Secondary outcomes included Healthcare Effectiveness Data and Information Set (HEDIS) initiation and engagement measures; 30-day abstinence from any alcohol and all drugs (including opioids, methamphetamine, cocaine, and marijuana), consequences from opioid and alcohol use, health-related quality of life, and any heavy drinking days.

Statistical Analysis
We conducted descriptive analyses to test the balance between CC and usual care group characteristics at baseline using a χ² test for categorical variables and a t test for continuous variables. Multivariable analyses controlled for characteristics that significantly differed between the 2 groups at an α level of 0.20. We conducted all evaluations as intent-to-treat analyses. We conducted multivariable logistic regression to test the hypothesis that CC increased utilization of OAUD treatment. All patient outcome analyses were weighted to represent the sample of patients recruited through randomization, using a raking algorithm in SAS (RAkinge). Because only patients who were currently using alcohol and/or opioids at baseline qualified for the study, for our primary outcome of abstinence from all opioids and alcohol, as well as 2 other secondary abstinence outcomes, we conducted a fixed effects linear probability model comparing patients in the UC and CC at 6 months after baseline, controlling for clinic enrollment site and relevant covariates, including age, race, diagnosis of heroin use disorder at baseline and clinic enrollment site. To test the relationship between CC and the remaining patient measures at baseline, we used fixed effects difference-in-difference regression models, controlling for time, clinic enrollment site, and relevant covariates. We conducted multivariable linear regression to model continuous outcomes, and both linear probability and logistic regression models for the categorical outcomes. Results from the logistic regression and linear probability models were similar, and for ease of interpretation, we present results from the linear probability models only.

Few missing values were observed for all variables except the SF-12 MCS and PCS measures. Owing to a programming error, approximately 200 respondents were given incorrect answer choices for 4 of the 12 component questions used to calculate the MCS and PCS. We therefore imputed 5 sets of
plausible values, with the stipulation that the distributions of the imputed variables remain similar to the observed data.\textsuperscript{55} Outcome model results were aggregated across these multiple imputed data sets using standard procedures.\textsuperscript{56}

**Results**

**Enrollment and Follow-up**

There were 15,723 unique adult primary care visits in the study period. Based on a predetermined sample of weekly screening audits, 94% to 98% of the visits were screened (approximately 15,000) by the medical assistants, 5% were eligible for referral, and 745 were referred to the study. Of those, 738 were assessed for eligibility (Figure), 452 were eligible, and 397 were randomized. Postrandomization, 20 were excluded after reporting either being in treatment or being abstinent in the 30 days prior to the assessment, leaving 377 in the analysis of outcomes (187 in CC and 190 in UC). Of those, 261 (69%) were interviewed at 6 months and included in analysis of patient outcomes. The 2 groups were comparable with respect to observed characteristics at baseline, with no differences at $P < .05$ (Table 1): 203 (54%) had only alcohol abuse or dependence, 115 (31%) abused or were dependent on heroin with or without cooccurring alcohol or prescription opioid abuse or dependence, and 59 (16%) had prescription opioid abuse or dependence with or without cooccurring alcohol abuse or dependence. One hundred eighty six (49.3%) were homeless.

**Delivery of Collaborative Care Intervention**

Of 187 individuals randomized to CC, 184 were entered into the registry, 171 (93%) met with the care coordinator, 143 (76%) scheduled an appointment with a CC therapist, 65 (45%) kept the appointment (number derived from patient registry and includes individuals subsequently excluded from the service system outcome analysis), and 37 had at least 1 additional psychotherapy session. Sixteen of the 24 clinicians who were trained prescribed XR-NTX and 11 of the 12 waivered prescribers prescribed BUP/NX; overall 17 of 28 clinicians who were trained prescribed XR-NTX and 11 of the 28 were excluded for eligibility (Figure), 452 were eligible, and 397 were randomized. Postrandomization, 20 were excluded after reporting either being in treatment or being abstinent in the 30 days prior to the assessment, leaving 377 in the analysis of outcomes (187 in CC and 190 in UC). Of those, 261 (69%) were interviewed at 6 months and included in analysis of patient outcomes. The 2 groups were comparable with respect to observed characteristics at baseline, with no differences at $P < .05$ (Table 1): 203 (54%) had only alcohol abuse or dependence, 115 (31%) abused or were dependent on heroin with or without cooccurring alcohol or prescription opioid abuse or dependence, and 59 (16%) had prescription opioid abuse or dependence with or without cooccurring alcohol abuse or dependence. One hundred eighty six (49.3%) were homeless.

**Treatment Utilization Outcomes**

Treatment utilization models were adjusted for age, race, heroin abuse or dependence, and clinic enrollment site. At 6 months, the proportion of participants who had received any evidence-based OAUD treatment was higher in the CC group compared with usual care (39.0% vs 16.8%; adjusted OR, 3.97; 95% CI, 2.32-6.79; $P < .001$) (Table 2). In secondary analyses, the proportion of participants receiving any BT, but not the proportion receiving any MAT, was higher in the CC group compared with usual care (35.8% vs 10.5%; adjusted OR, 6.22; 95% CI, 3.36-11.52; $P < .001$; 13.4% vs 12.6%; adjusted OR, 1.23; 95% CI, 0.64-2.38). The proportion meeting the HEDIS initiation and engagement measures was also higher in the CC group than in usual care (initiation, 31.6% vs 13.7%; adjusted OR, 3.54; 95% CI, 2.02-6.20; $P < .001$; engagement, 15.5% vs 4.2%; adjusted OR, 5.89; 95% CI, 2.43-14.32; $P < .001$).

**Participant Outcomes**

At 6 months, the proportion of participants abstinent from all opioids or any alcohol was 10.5 percentage points higher in the CC group compared with usual care (32.8 vs 22.3 percentage points) (Table 3). After adjustment for covariates, abstinence remained higher by 12 percentage points in the CC group (effect estimate, $\beta = 0.12$; 95% CI, 0.01-0.23; \(P = .03\)). Only 1 of the 7 secondary outcomes—abstinence from opioids, cocaine, methamphetamines, marijuana, and any alcohol—showed a significant improvement in the CC group, (26.3% vs 15.6%; effect estimate, $\beta = 0.13$; 95% CI, 0.03-0.23; \(P = .01\)). Patient outcome models were adjusted for age, race, receipt of SUD treatment in the previous 12 months, and clinic enrollment site.

**Discussion**

We found that a CC intervention implemented in a multisite FQHC increased both the proportion of primary care patients receiving evidence-based treatment for OAUD, and the number achieving self-reported abstinence from opioids or alcohol use at 6 months, compared with usual care. Among individuals with SUDs, abstinence is linked to a decreased
Table 1. Characteristics of Study Participants at Baseline and 6 Months

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Baseline Overall (n = 377)</th>
<th>Treatment (n = 187)</th>
<th>Control (n = 190)</th>
<th>6-Month Follow-up Overall (n = 261)</th>
<th>Treatment (n = 138)</th>
<th>Control (n = 123)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD), y</td>
<td>42 (12.0)</td>
<td>41 (11.7)</td>
<td>43 (12.2)</td>
<td>42 (12.1)</td>
<td>41 (12.2)</td>
<td>43 (12.1)</td>
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<tr>
<td>Female, No. (%)</td>
<td>77 (20.4)</td>
<td>39 (20.9)</td>
<td>38 (20.0)</td>
<td>63 (24.1)</td>
<td>31 (22.5)</td>
<td>32 (26.0)</td>
</tr>
<tr>
<td>Race, No. (%)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>White</td>
<td>165 (43.8)</td>
<td>79 (42.2)</td>
<td>86 (45.3)</td>
<td>107 (41.0)</td>
<td>52 (37.7)</td>
<td>55 (44.7)</td>
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<tr>
<td>Black</td>
<td>50 (13.3)</td>
<td>24 (12.8)</td>
<td>26 (13.7)</td>
<td>43 (16.5)</td>
<td>19 (13.8)</td>
<td>24 (19.5)</td>
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<tr>
<td>American Indian/Alaska Native</td>
<td>5 (1.3)</td>
<td>2 (1.1)</td>
<td>3 (1.6)</td>
<td>3 (1.1)</td>
<td>2 (1.4)</td>
<td>1 (0.8)</td>
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<td>Native Hawaiian/Pacific Islander</td>
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<td>2 (1.1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Asian</td>
<td>3 (0.8)</td>
<td>1 (0.5)</td>
<td>2 (1.1)</td>
<td>3 (1.1)</td>
<td>1 (0.7)</td>
<td>2 (1.6)</td>
</tr>
<tr>
<td>Other</td>
<td>101 (26.8)</td>
<td>48 (25.7)</td>
<td>53 (27.9)</td>
<td>70 (26.8)</td>
<td>39 (28.3)</td>
<td>31 (25.2)</td>
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<tr>
<td>Multiple</td>
<td>51 (13.5)</td>
<td>31 (16.6)</td>
<td>20 (10.5)</td>
<td>35 (13.4)</td>
<td>25 (18.1)</td>
<td>10 (8.1)</td>
</tr>
<tr>
<td>Hispanic origin</td>
<td>117 (31.0)</td>
<td>56 (29.9)</td>
<td>61 (32.1)</td>
<td>81 (31.0)</td>
<td>43 (31.0)</td>
<td>38 (31.0)</td>
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<td>Education, No. (%)</td>
<td></td>
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<tr>
<td>Less than high school</td>
<td>105 (27.9)</td>
<td>52 (27.8)</td>
<td>53 (27.9)</td>
<td>68 (26.1)</td>
<td>36 (26.1)</td>
<td>32 (26.0)</td>
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<tr>
<td>High school graduate/GED</td>
<td>117 (31.0)</td>
<td>54 (28.9)</td>
<td>63 (33.2)</td>
<td>78 (29.9)</td>
<td>39 (28.3)</td>
<td>39 (31.7)</td>
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<tr>
<td>More than high school</td>
<td>155 (41.1)</td>
<td>81 (43.3)</td>
<td>74 (38.9)</td>
<td>115 (44.1)</td>
<td>61 (45.7)</td>
<td>52 (42.3)</td>
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<tr>
<td>Homeless, No. (%)</td>
<td>186 (49.3)</td>
<td>88 (47.1)</td>
<td>98 (51.6)</td>
<td>77 (29.5)</td>
<td>38 (27.5)</td>
<td>39 (31.7)</td>
</tr>
<tr>
<td>PHQ-8 depressive symptoms score, mean (SD)</td>
<td>12 (6.4)</td>
<td>11 (6.5)</td>
<td>12 (6.2)</td>
<td>9 (6.3)</td>
<td>8 (6.2)</td>
<td>9 (6.4)</td>
</tr>
<tr>
<td>SF-12 MCS mental health-related quality-of-life score, mean (SD)</td>
<td>40 (11.0)</td>
<td>40 (10.8)</td>
<td>39 (10.9)</td>
<td>42 (11.8)</td>
<td>43 (11.7)</td>
<td>42 (11.8)</td>
</tr>
<tr>
<td>SF-12 PCS physical health-related quality-of-life score, mean (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>47 (10.3)</td>
<td>48 (9.9)</td>
<td>47 (10.2)</td>
<td>48 (10.5)</td>
<td>49 (10.0)</td>
<td>46 (10.8)</td>
</tr>
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<td>CIDI diagnosis, No. (%)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Only alcohol abuse or dependence</td>
<td>203 (53.8)</td>
<td>104 (56.0)</td>
<td>99 (52.0)</td>
<td>149 (57.1)</td>
<td>79 (57.2)</td>
<td>70 (56.9)</td>
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<tr>
<td>Heroin abuse or dependence, with or without co-occurring alcohol or prescription opioid abuse or dependence</td>
<td>115 (30.5)</td>
<td>51 (27.0)</td>
<td>64 (34.0)</td>
<td>70 (26.8)</td>
<td>34 (24.6)</td>
<td>36 (29.3)</td>
</tr>
<tr>
<td>Prescription opioid abuse or dependence, with or without co-occurring alcohol abuse or dependence</td>
<td>59 (15.6)</td>
<td>32 (17.1)</td>
<td>27 (14.2)</td>
<td>42 (16.1)</td>
<td>25 (18.1)</td>
<td>17 (13.8)</td>
</tr>
<tr>
<td>Any alcohol use, past 30 days, No. (%)</td>
<td>355 (94.2)</td>
<td>174 (93.0)</td>
<td>181 (95.3)</td>
<td>189 (72.4)</td>
<td>94 (68.1)</td>
<td>95 (77.2)</td>
</tr>
<tr>
<td>Any heroin use, past 30 days, No. (%)</td>
<td>69 (18.3)</td>
<td>31 (16.6)</td>
<td>38 (20.0)</td>
<td>22 (8.4)</td>
<td>9 (6.5)</td>
<td>13 (10.6)</td>
</tr>
<tr>
<td>Any prescription opioid use, past 30 days, No. (%)</td>
<td>88 (23.3)</td>
<td>42 (22.5)</td>
<td>46 (24.2)</td>
<td>22 (8.4)</td>
<td>14 (10.1)</td>
<td>8 (6.3)</td>
</tr>
<tr>
<td>Any methamphetamine use, past 30 days, No. (%)</td>
<td>96 (25.5)</td>
<td>46 (24.6)</td>
<td>50 (26.3)</td>
<td>36 (13.8)</td>
<td>13 (9.4)</td>
<td>23 (18.7)</td>
</tr>
<tr>
<td>Any cocaine use, past 30 days, No. (%)</td>
<td>62 (16.4)</td>
<td>35 (18.7)</td>
<td>27 (14.2)</td>
<td>32 (12.3)</td>
<td>18 (13.0)</td>
<td>14 (11.4)</td>
</tr>
<tr>
<td>Typical drinks per day, past 12 months, median (IQR)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6 (3-10)</td>
<td>6 (3-10)</td>
<td>6 (4-11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of heroin use, median, (IQR)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4 (2-10)</td>
<td>4 (2-10)</td>
<td>5 (2-11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever hospitalized for alcohol or opioid use, No. (%)</td>
<td>101 (26.8)</td>
<td>46 (24.6)</td>
<td>55 (28.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency department visit or hospital stay, past 90 days, No. (%)</td>
<td>139 (36.9)</td>
<td>72 (38.5)</td>
<td>67 (35.3)</td>
<td>55 (21.1)</td>
<td>27 (19.6)</td>
<td>28 (22.8)</td>
</tr>
<tr>
<td>Substance use treatment, past 12 months, No. (%)</td>
<td>50 (13.3)</td>
<td>21 (11.2)</td>
<td>29 (15.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discussed substance use with a professional, lifetime, No. (%)</td>
<td>219 (58.1)</td>
<td>107 (57.2)</td>
<td>112 (58.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short Inventory of Problems-Alcohol and Drugs score, past 3 months, median (IQR)&lt;sup&gt;d&lt;/sup&gt;</td>
<td>11 (5-14)</td>
<td>10 (5-14)</td>
<td>11 (6-14)</td>
<td>5 (0-11)</td>
<td>6 (0-11)</td>
<td>5 (0-12)</td>
</tr>
<tr>
<td>Arrested owing to drinking, lifetime, median (IQR)</td>
<td>3 (1-6)</td>
<td>3 (1-5)</td>
<td>3 (1-7)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: CC, collaborative care; GED, general education development; IQR, interquartile range; MCS, mental health composite scale; PHQ-8, patient health questionnaire depression scale; PCS, physical health composite scale; SF-12, 12-item short form survey.

* Participant considered homeless if spent previous night sleeping outside, in a shelter, in an abandoned building, or lacks a regular place to stay.

<sup>a</sup> P < .05 between treatment and control group at follow-up.
<sup>b</sup> Limited to those who reported having used alcohol in the past (n = 366).
<sup>c</sup> Limited to those who reported having used heroin in the past (n = 149).
Collaborative Care for Opioid and Alcohol Use Disorders in Primary Care

Original Investigation Research

Table 2. Effects of Collaborative Care on OAUD Treatment Utilization and Patient Outcomes

<table>
<thead>
<tr>
<th>Treatment Utilization Outcomes</th>
<th>No. (%)</th>
<th>Odds Ratioa (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient received any evidence-based treatment (BT or MAT)</td>
<td>CC (n = 187)</td>
<td>Usual Care (n = 190)</td>
<td>3.97 (2.3-6.8)</td>
</tr>
<tr>
<td>Patient received any BT</td>
<td>73 (39.0)</td>
<td>32 (16.8)</td>
<td>6.22 (3.4-11.5)</td>
</tr>
<tr>
<td>Patient received any medication assisted treatment</td>
<td>CC (n = 138)</td>
<td>Usual Care (n = 123)</td>
<td>3.54 (2.0-6.2)</td>
</tr>
<tr>
<td>HEDIS Initiation</td>
<td>59 (31.6)</td>
<td>26 (13.7)</td>
<td></td>
</tr>
<tr>
<td>HEDIS Engagement</td>
<td>29 (15.5)</td>
<td>8 (4.2)</td>
<td>5.89 (2.4-14.3)</td>
</tr>
</tbody>
</table>

Table 3. Participant Outcomesa

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Baseline, %b</th>
<th>6-Month Follow-up, %c</th>
<th>Effect Estimatea (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC (n = 187)</td>
<td>Usual Care (n = 190)</td>
<td>CC (n = 138)</td>
<td>Usual Care (n = 123)</td>
<td></td>
</tr>
<tr>
<td>Patient received any evidence-based treatment (BT or MAT)</td>
<td>73 (39.0)</td>
<td>32 (16.8)</td>
<td>3.97 (2.3-6.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Patient received any BT</td>
<td>67 (35.8)</td>
<td>20 (10.5)</td>
<td>6.22 (3.4-11.5)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Patient received any medication assisted treatment</td>
<td>25 (13.4)</td>
<td>24 (12.6)</td>
<td>1.23 (0.6-2.4)</td>
<td>.53</td>
</tr>
<tr>
<td>HEDIS Initiation</td>
<td>59 (31.6)</td>
<td>26 (13.7)</td>
<td>3.54 (2.0-6.2)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>HEDIS Engagement</td>
<td>29 (15.5)</td>
<td>8 (4.2)</td>
<td>5.89 (2.4-14.3)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Abbreviations: CC, collaborative care; HEDIS, Healthcare Effectiveness Data and Information Set.

a Multivariable logistic regression controlling for age, race, diagnosis of heroin use disorder at baseline, and clinic enrollment site.

All 6-month results are weighted to be analogous to baseline sample.

Parameter estimates from a linear probability model controlling for age, race, receipt of substance abuse treatment in the 12 months prior to baseline, and clinic enrollment site.

Patients who abstained from opioids or did not report any heavy drinking in the 30 days prior to baseline were excluded from this analysis.

Among our sample both severity and unmet need were high, with over one-quarter having been hospitalized for their OAUD use; only 209 (58.1%) had previously discussed substance use with a professional; and only 50 (13.3%) had received any treatment during the prior 12 months. In addition, with nearly half the sample homeless at the time of enrollment, our study included a population with special challenges to engage and treat successfully.66,67

To our knowledge, this is the first study to implement and test CC for OAUD in a community clinic setting. Our intervention differed from previous studies to increase treatment for OAUD in several important ways, which may have contributed to our results.30,68 We recruited participants when they presented to their regular clinician, rather than through residential detoxification services, advertisements, or community referrals.30 Treatment for OAUD was delivered by participants’...
primary care clinician or by behavioral health professionals integrated with the clinic rather than through a specialty addiction medicine clinic or specialty care. Using participants’ usual care clinicians may have increased participant motivation or decreased stigma, leading to better outcomes. It may have also reduced barriers to treatment utilization.

Although results favored CC, receipt of evidence-based treatment was still relatively low (73 [39%]) and only 25 (13%) of CC participants received MAT. It is not clear whether the low rate of MAT is related to clinician supply or patient demand. Of the 28 clinicians at the 2 clinics, 17 (61%) prescribed MAT, suggesting that clinicians integrated MAT treatment into their practice and the organization had increased its capacity to provide MAT. However, clinicians did not regularly participate in the team meetings attended by the care coordinators, therapists, and addiction specialists, citing a lack of protected time. The low rates of treatment and MAT specifically may also be owing to patients not identifying as having an OAUD, since most accessed primary care for reasons perceived as unrelated to substance use. Population-based data suggest that over 90% of individuals with substance use disorders do not perceive a need for treatment. Given this, BT may have been seen as a more acceptable initial treatment option.

Strengths and Limitations

Our study has several strengths. The study population was ethnically and racially diverse, and the FQHC served a low-income population. Existing staff were trained to deliver the intervention and treatment. This approach supports the intervention’s feasibility and long-term sustainability, and its transportability to other similar FQHCs. Screening at every visit and use of the registry facilitated population-based management; regular symptom assessment facilitated measurement-based care. It is notable that in both groups we observed increased abstinence, which may speak to the power of the primary care relationship.

There were also limitations. The study took place at an FQHC with integrated behavioral health. Thus, results may not generalize to other types of settings. By design, the clinics undertook a year-long effort to prepare to provide OAUD treatment before the trial, which may limit dissemination. However, to the extent that this preparation phase may have biased results, it would be toward the null hypothesis. We assessed patient outcomes by self-report, because biological tests are inadequate for detecting 30-day opioid and alcohol use. Although we used validated tools, social desirability bias may have influenced CC participants to report abstinence more than participants receiving usual care. We had differential retention, and individuals lost to follow-up may have had worse outcomes than those for whom we have outcome data. There was also no follow-up after 6 months, and we do not know if the effect was sustained. Finally, patient-level vs clinic-level randomization may have increased the likelihood of spillover, but to the extent that this occurred it would have weakened statistical power to detect differences between groups.

Conclusions

Among adults with OAUDs seen in primary care, the SUMMIT intervention resulted in significantly more evidence-based treatment and abstinence from alcohol and drugs at 6 months, compared with usual care. These findings suggest that treatment for OAUDs can be integrated into primary care, and that primary care-based treatment is effective for OAUDs.

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Role of the Funder/Sponsor: The National Institute on Drug Abuse had no role in design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation, review, or approval of the manuscript or the decision to submit for publication. Alkermes provided long-acting injectable naltrexone at no charge to patients with alcohol use disorders who were prescribed the medication by their primary care physician. This arrangement was disclosed and approved by the National Institutes of Health project officer, as well as to the RAND Human Subjects Protection Committee.

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Hruby, BFA, all at the RAND Corporation for their contributions to carrying out the study; they were compensated. We also acknowledge the SUMMIT Scientific Advisory Board for their input on the study design and protocols: Frank de Gruy, MD, University of Colorado, Denver; Adam Gordon, MD, MPH, FACP, DFAASAM, University of Utah; Miriam Komaromy, MD, University of New Mexico; Walter Ling, MD, University of California, Los Angeles; Tom McLellan, PhD, Treatment Research Institute; Richard Rawson, PhD, University of California, Los Angeles; Richard Salz, MD, MPH, FACP, DFAASAM, Boston University; and Jurgen Unützer, MD, MPH, MA, University of Washington; all received honorariums for their contributions.

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