Supplemental Online Content

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**eFigure 1.** Most Common Participant Emergency Department Diagnoses Coded as Emergent, Nonemergent, and Substance Use-Related

**eFigure 2.** Estimated Percentage of Participants by Group With Health Care System Engagement per Year of Study Follow-up

**eTable 1.** Health System Engagement Associated With Study Group Using Multiply Imputed Data

**eTable 2.** Health System Engagement Associated With Study Group, Complete Cases, No Deaths

**eTable 3.** Five-Year Health Care Use by Study Groups, Multiply Imputed Data

**eTable 4.** Five-Year Health Care Use by Study Group, Complete Cases, No Deaths

This supplemental material has been provided by the authors to give readers additional information about their work.
eFigure 1. Most Common Participant Emergency Department Diagnoses Coded as Emergent, Nonemergent, and Substance Use-Related

| Classification       | Primary Emergency Department Diagnosis                                                                 |
|----------------------|--------------------------------------------------------------------------------------------------------|
| Emergent             | Chest pain, unspecified                                                                                  |
|                      | Abdominal pain, unspecified site                                                                         |
|                      | Other chest pain                                                                                        |
|                      | Syncope and collapse                                                                                   |
|                      | Unspecified septicemia                                                                                  |
|                      | Abdominal pain, other specified site                                                                     |
|                      | Headache                                                                                               |
|                      | Issue of repeat prescriptions                                                                         |
|                      | Other malaise and fatigue                                                                               |
|                      | Lumbago                                                                                               |
|                      | Nausea with vomiting                                                                                    |
|                      | Painful respiration                                                                                    |
|                      | Urinary tract infection, site not specified                                                            |
|                      | Dizziness and giddiness                                                                               |
|                      | Diarrhea                                                                                              |
|                      | Other convulsions                                                                                      |
|                      | Unspecified abdominal pain                                                                             |
|                      | Unspecified gastritis and gastroduodenitis, without mention of hemorrhage                              |
|                      | Diabetes mellitus without mention of complication, type II or unspecified type, not stated as uncontrolled|
|                      | Epigastric pain                                                                                        |
|                      | Non-emergent                                                                                          |
|                      | Headache                                                                                              |
|                      | Issue of repeat prescriptions                                                                         |
|                      | Other malaise and fatigue                                                                               |
|                      | Lumbago                                                                                               |
|                      | Nausea with vomiting                                                                                    |
|                      | Urinary tract infection, site not specified                                                            |
|                      | Dizziness and giddiness                                                                               |
|                      | Diarrhea                                                                                              |
|                      | Diabetes mellitus without mention of complication, type II or unspecified type, not stated as uncontrolled|
|                      | Calculus of gallbladder without mention of cholecystitis, without mention of obstruction              |
|                      | Pneumonia, organism unspecified                                                                       |
|                      | Unspecified viral infection                                                                            |
|                      | Chronic or unspecified duodenal ulcer with hemorrhage, without mention of obstruction                  |
|                      | Esophageal reflux                                                                                      |
|                      | Low back pain                                                                                         |
|                      | Migraine, unspecified, without mention of intractable migraine without mention of status migrainosus    |
|                      | Rash and other nonspecific skin eruption                                                               |
|                      | Other and unspecified noninfectious gastroenteritis and colitis                                        |
|                      | Pain in joint, shoulder region                                                                         |
|                      | Pyelonephritis, unspecified                                                                            |
|                      | Substance Use-related                                                                                  |
|                      | Alcohol withdrawal                                                                                     |
|                      | Alcohol abuse, unspecified                                                                             |
|                      | Acute alcoholic intoxication in alcoholism, unspecified                                                |
|                      | Other and unspecified alcohol dependence, unspecified                                                 |
|                      | Acute alcoholic intoxication in alcoholism, continuous                                                 |
|                      | Alcohol dependence with withdrawal, unspecified                                                        |
|                      | Alcohol abuse, continuous                                                                              |
|                      | Alcohol withdrawal delirium                                                                            |
|                      | Drug withdrawal                                                                                        |
|                      | Other, mixed, or unspecified drug abuse, unspecified                                                   |
|                      | Alcohol dependence, uncomplicated                                                                      |
|                      | Alcohol abuse with intoxication, unspecified                                                          |
|                      | Alcohol abuse, uncomplicated                                                                          |
|                      | Alcohol dependence with intoxication, unspecified                                                     |
|                      | Alcohol gastritis, without mention of hemorrhage                                                       |
|                      | Amphetamine and other psychostimulant dependence, unspecified                                          |
|                      | Alcohol dependence with withdrawal, uncomplicated                                                     |
|                      | Other and unspecified alcohol dependence, episodic                                                     |
|                      | Alcohol abuse with intoxication, uncomplicated                                                         |
|                      | Alcohol abuse, episodic                                                                                |

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Marginal percent estimates by group were plotted from a modified Poisson generalized estimating equations model per outcome including time as a categorical variable, a time x group interaction term, and age, Charlson comorbidity index, and baseline emergent-type emergency department use.
**eTable 1. Health System Engagement Associated With Study Group Using Multiply Imputed Data**

| Time | Substance use discussion with primary care provider<sup>a</sup> | Electronic patient portal logins | Online medication refills | Secure electronic messages sent to health care provider |
|------|-------------------------------------------------------------|---------------------------------|---------------------------|------------------------------------------------------|
|      | RR (95% CI) | P value | RR (95% CI) | P value | RR (95% CI) | P value | RR (95% CI) | P value |
| Yr. 1 | 1.26 (0.99-1.60) | .06 | 1.32 (1.18-1.47) | < .001 | 1.70 (1.45-1.99) | < .001 | 1.32 (1.13-1.54) | < .001 |
| Yr. 2 | 1.09 (0.83-1.44) | .54 | 1.16 (1.02-1.31) | .02 | 1.23 (1.05-1.46) | .01 | 1.21 (1.04-1.42) | .02 |
| Yr. 3 | — | — | 1.06 (0.94-1.20) | .33 | 1.11 (0.93-1.32) | .24 | 1.12 (0.95-1.33) | .19 |
| Yr. 4 | — | — | 1.07 (0.95-1.20) | .27 | 1.08 (0.91-1.27) | .38 | 1.05 (0.89-1.24) | .55 |
| Yr. 5 | 1.26 (0.76-2.07) | .37 | 1.05 (0.94-1.17) | .39 | 1.13 (0.96-1.33) | .13 | 1.05 (0.90-1.23) | .54 |
| All years (1-5)<sup>c</sup> | 1.20 (0.99-1.45) | .07 | 1.12 (1.03-1.21) | .01 | 1.23 (1.09-1.38) | .001 | 1.12 (1.00-1.25) | .06 |

Time: year since study enrollment; RR: risk ratio; CI: confidence interval.

<sup>a</sup> Telephone interviews were conducted at 1, 2, and 5 years after study enrollment.

<sup>b</sup> Group differences were estimated from a modified Poisson regression model per follow-up time point, adjusting for baseline age, Charlson comorbidity index, and emergent-type ED use.

<sup>c</sup> Group differences were estimated from a modified Poisson generalized estimating equations model, adjusting for (linear) time and baseline age, Charlson comorbidity index, and emergent-type ED use.
**eTable 2. Health System Engagement Associated With Study Group, Complete Cases, No Deaths**

| Time   | Substance use discussion with primary care provider | Electronic patient portal logins | Online medication refills | Secure messages sent to health care provider |
|--------|-----------------------------------------------------|---------------------------------|---------------------------|---------------------------------------------|
|        | RR (95% CI)                                         | RR (95% CI)                     | RR (95% CI)               | RR (95% CI)                                 |
|        | P value                                             | P value                         | P value                   | P value                                     |
| Yr. 1  | 1.50 (1.08-2.07)                                    | 1.35 (1.17-1.56)                | 2.05 (1.61-2.61)          | 1.47 (1.18-1.84)                            |
|        | .02                                                 | < .001                          | < .001                    | .001                                        |
| Yr. 2  | 1.24 (0.85-1.79)                                    | 1.18 (1.00-1.38)                | 1.28 (1.04-1.59)          | 1.36 (1.09-1.69)                            |
|        | .26                                                 | .048                            | .02                       | .01                                         |
| Yr. 3  | —                                                   | 1.07 (0.93-1.23)                | 1.12 (0.91-1.38)          | 1.16 (0.94-1.44)                            |
|        | —                                                   | .35                             | .28                       | .17                                         |
| Yr. 4  | —                                                   | 1.10 (0.95-1.27)                | 1.20 (0.99-1.45)          | 1.11 (0.91-1.34)                            |
|        | —                                                   | .21                             | .07                       | .30                                         |
| Yr. 5  | 1.19 (0.59-2.41)                                    | 1.06 (0.93-1.21)                | 1.18 (0.95-1.46)          | 1.09 (0.90-1.33)                            |
|        | .62                                                 | .40                             | .13                       | .36                                         |
| All years (1-5)c | 1.32 (1.02-1.69)                                    | 1.16 (1.03-1.30)                | 1.42 (1.21-1.68)          | 1.22 (1.04-1.43)                            |
|        | .03                                                 | .01                             | < .001                    | .02                                         |

Time: year since study enrollment; RR: risk ratio; CI: confidence interval.

a Telephone interviews were conducted at 1, 2, and 5 years after study enrollment.

b Group differences were estimated from a modified Poisson regression model per follow-up time point, adjusting for baseline age, Charlson comorbidity index, and emergent-type ED use.

c Group differences were estimated from a modified Poisson generalized estimating equations model, adjusting for (linear) time and baseline age, Charlson comorbidity index, and emergent-type ED use.
### eTable 3. Five-Year Health Care Use by Study Groups, Multiply Imputed Data

| Health care service use | Group differences in annual change over the 5 years since study enrollment<sup>a</sup> | Risk Ratio (95% CI) | P value | Time-adjusted group differences across 5 years post-study enrollment<sup>b</sup> | Risk Ratio (95% CI) | P value |
|-------------------------|----------------------------------|--------------------|---------|----------------------------------|--------------------|---------|
| Primary care            |                                  | 1.03 (1.00-1.07)   | .03     |                                  | 1.00 (0.94-1.06)   | .97     |
| Emergency department    |                                  | 0.97 (0.90-1.06)   | .52     |                                  | 0.92 (0.76-1.10)   | .34     |
| Emergent                |                                  | 0.95 (0.78-1.16)   | .63     |                                  | 1.03 (0.70-1.53)   | .87     |
| Non-emergent            |                                  | 1.00 (0.84-1.18)   | .97     |                                  | 0.77 (0.58-1.01)   | .06     |
| Substance-related       |                                  | 0.86 (0.70-1.06)   | .16     |                                  | 0.84 (0.51-0.99)   | .48     |

CI: confidence interval.

<sup>a</sup> Group × linear time effect; modified Poisson generalized estimating equations models included (linear) time, a time x group interaction term, and baseline age, Charlson comorbidity index, and emergent-type emergency department use.

<sup>b</sup> Time-adjusted group effect; GEE models included (linear) time, no interaction term, and baseline age, Charlson comorbidity index, and emergent-type emergency department use.
### eTable 4. Five-Year Health Care Use by Study Group, Complete Cases, No Deaths

| Health care service use             | Group differences in annual change over the 5 years since study enrollment<sup>a</sup> | Time-adjusted group differences across 5 years post-study enrollment<sup>b</sup> |
|------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|                                    | Risk Ratio (95% CI) | P value | Risk Ratio (95% CI) | P value |
| Primary care                       | 1.05 (1.01-1.09) | .01     | 0.98 (0.91-1.05) | .60     |
| Emergency department               | 0.98 (0.87-1.10) | .69     | 0.89 (0.68-1.16) | .37     |
| Emergent                           | 0.81 (0.62-1.06) | .12     | 1.34 (0.79-2.28) | .28     |
| Non-emergent                       | 1.12 (0.89-1.39) | .34     | 0.60 (0.39-0.93) | .02     |
| Substance-related                  | 0.71 (0.56-0.92) | .01     | 0.73 (0.35-1.52) | .40     |

CI: confidence interval.

<sup>a</sup> Group × linear time effect; modified Poisson generalized estimating equations models included (linear) time, a time × group interaction term, and baseline age, Charlson comorbidity index, and emergent-type emergency department use.

<sup>b</sup> Time-adjusted group effect; modified Poisson generalized estimating equations models included (linear) time, no interaction term, and baseline age, Charlson comorbidity index, and emergent-type emergency department use.