Improving Access to Geriatric Mental Health Services: A Randomized Trial Comparing Treatment Engagement With Integrated Versus Enhanced Referral Care for Depression, Anxiety, and At-Risk Alcohol Use

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Objective: The authors sought to determine whether integrated mental health services or enhanced referral to specialty mental health clinics results in greater engagement in mental health/substance abuse services by older primary care patients.

Method: This multisite randomized trial included 10 sites consisting of primary care and specialty mental health/substance abuse clinics. Primary care patients 65 years old or older (N=24,930) were screened. The final study group consisted of 2,022 patients (mean age=73.5 years; 26% female; 48% ethnic minority) with depression (N=1,390), anxiety (N=70), at-risk alcohol use (N=414), or dual diagnosis (N=148) who were randomly assigned to integrated care (mental health and substance abuse providers co-located in primary care; N=999) or enhanced referral to specialty mental health/substance abuse clinics (i.e., facilitated scheduling, transportation, payment; N=1,023).

Results: Seventy-one percent of patients engaged in treatment in the integrated model compared with 49% in the enhanced referral model. Integrated care was associated with more mental health and substance abuse visits per patient (mean=3.04) relative to enhanced referral (mean=1.91). Overall, greater engagement was predicted by integrated care and higher mental distress. For depression, greater engagement was predicted by integrated care and more severe depression. For at-risk alcohol users, greater engagement was predicted by integrated care and more severe problem drinking. For all conditions, greater engagement was associated with closer proximity of mental health/substance abuse services to primary care.

Conclusions: Older primary care patients are more likely to accept collaborative mental health treatment within primary care than in mental health/substance abuse clinics. These results suggest that integrated service arrangements improve access to mental health and substance abuse services for older adults who underuse these services.

Despite poor health outcomes and increased health care costs associated with psychiatric disorders in older adults (1, 2), mental health services are underutilized, and access to assessment and treatment by specialty mental health providers is poor (3, 4). Fewer than 3% of older adults report seeing a mental health professional for treatment, a rate lower than that of any other adult age group (5). Instead, older adults tend to seek mental health treatment in primary care, a system stressed by the demands of complex medical disorders and severe time constraints (6). One approach to overcoming barriers to mental health consultation and treatment services involves improving the system of referral to specialty mental health clinics. Enhancements include selecting mental health clinics with services tailored to older persons, providing transportation and third-party payment coverage, and minimizing time from referral to visit with the specialty mental health provider (4, 7, 8). An alternative approach consists of improving access through co-location of services and collaboration between mental health and primary care providers (9). Integrated, collaborative care management has been shown to improve outcomes for older adults with depression relative to usual care by the primary care provider (10).

However, no study has compared an integrated mental health/substance abuse services model to that of enhanced referral to specialty mental health/substance abuse clinics in improving access for older adults. Furthermore, no study has evaluated treatment engagement in these competing models for a broader array of common disorders, including depression, anxiety disorders, and at-risk alcohol use. This article reports the initial results of the Primary Care Research in Substance Abuse and Mental Health for the Elderly study, a randomized clinical trial comparing an enhanced referral model with integrated

FIGURE 1. Participant Progression Through the Primary Care Research in Substance Abuse and Mental Health for the Elderly Study
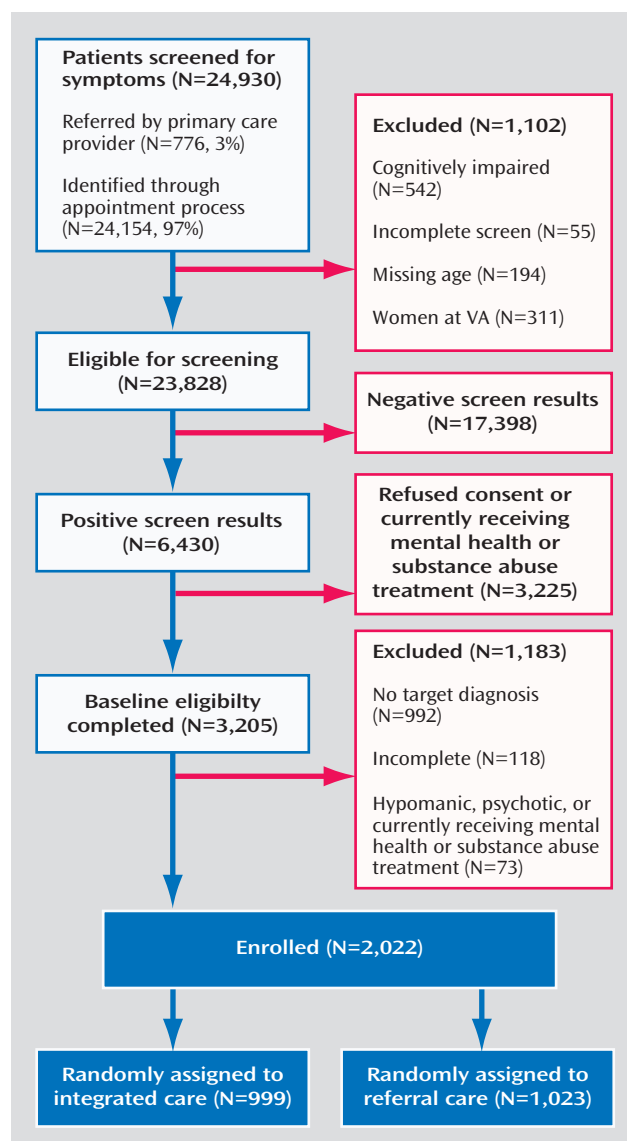
mental health/substance abuse services in primary care. Specific questions addressed include the following:

1. Which service delivery model results in greater engagement in mental health/substance abuse services by older primary care patients with depression, anxiety disorders, or at-risk alcohol use?
2. Are specific demographic characteristics, diagnoses, or severity of symptoms associated with greater engagement in either model?

Method

The study was a multisite randomized trial comparing integrated and enhanced referral models of mental health care for older persons with depression, anxiety, or at-risk alcohol consumption. The integrated model provided mental health/sub-

stance abuse services in the primary care clinic by a mental health provider. The enhanced referral model provided mental health/substance abuse services in a specialty setting that was physically separate and designated as a mental health/substance abuse clinic. A comprehensive account of the study methods is provided in a companion paper (11).

Subjects

A total of 24,930 primary care patients age 65 and older were screened for a mental health disorder or at-risk drinking between March 2000 and October 2001 (Figure 1). A positive screen was defined as significant psychological distress on the General Health Questionnaire (12), a positive response to suicidal ideation questions modified from the PRIME-MD (13), or at-risk alcohol consumption based on quantity/frequency criteria (14) of more than seven drinks/week or more than two binge episodes in the past 3 months consisting of more than three drinks on a single occasion. Primary care providers also directly referred 776 patients to the study, representing 3.1% of the total sample screened.

Patients who had received mental health/substance abuse treatment in the preceding 3 months and patients with severe cognitive impairment (≥16 on the Brief Orientation Memory Concentration Test [15]) were excluded. Primary care providers were given the opportunity to withdraw patients with positive screens for medical reasons; this occurred in fewer than 1% of patients eligible for baseline assessment. In the first stage of screening, incomplete data or cognitive impairment eliminated 1,102 patients, and 17,398 had negative screen results. Of the remaining 6,430 patients with positive screens, 3,225 elected not to proceed to a baseline assessment interview. Compared with those who consented, those who refused baseline assessment were more likely to be male (84.9% versus 74.7%) (χ^2=105.8, df=1, p<0.001) and Caucasian (72.2% versus 60.3%) (χ^2=104.9, df=1, p<0.001); have a lower mean General Health Questionnaire score (mean= 3.5 [SD=3.1] versus 4.3 [SD=3.1]) (z=11.2, p<0.001), indicating less severe distress; and more reported drinks per week (mean=6.0 [SD=11.5] versus 5.1 [SD=9.8]) (z=–3.27, p=0.001).

Following the first stage of screening, 3,205 patients completed the baseline assessment for depression, anxiety, and at-risk drinking target conditions to determine eligibility for the study. Presence of target conditions was assessed by using the Mini-International Neuropsychiatric Interview (16), Center for Epidemiological Studies Depression Scale (CES-D Scale) (17), Beck Anxiety Inventory (18), an alcohol quantity/frequency scale, and a detailed medication review. Additional assessments included demographic data, the Paykel Suicide Scale (19), the Short Michigan Alcohol Screening Test—Geriatric Version (20), and the Medical Outcomes Study 36-Item Short Form (21). Patients with a positive assessment on the Mini-International Neuropsychiatric Interview for psychosis, mania, or hypomania were excluded (N=73). Patients with incomplete data (N=118) or no target diagnosis (N= 992) were also excluded.

The final study group comprised 2,022 patients who met criteria, gave written informed consent after study procedures were fully explained, and were randomly assigned to receive integrated care (N=999) or enhanced referral care (N=1,023). Patients were recruited from five Department of Veterans Affairs medical centers (N=1,220 [60.3%]), three community health centers (N=535 [26.5%]), and two outpatient hospital networks (N=267 [13.2%]).

There were no significant differences in demographic characteristics between patients randomly assigned to the integrated condition and those assigned to the referral condition. Mean age of the sample was 73.5 years (SD=6.2), and almost three-quarters (N=1,498 [74.1%]) were male. Nearly half of the sample was married (N=972 [48%]), two-fifths had completed less than 12 years of schooling (N=875 [43%]), and one-fifth had limited finances as defined by "difficulty in making ends meet" (N=415 [21%]). Partic-

ipants had an average of 2.8 close friends and relatives (SD=1.20). Slightly over half of the sample was Caucasian (52.0%); the next most frequent racial group was African American (24.8%), followed by Hispanic Latino (14.8%), Asian (5.6%), and other (2.9%).

There were no between-group differences in medical or psychiatric severity as assessed with the Medical Outcomes Study 36-Item Short Form, CES-D Scale, Beck Anxiety Inventory, drinks per week, or comorbid psychiatric or medical diagnoses. On average, the sample had a mean of 4.7 chronic diseases (SD=2.5) and had substantial physical and mental distress as measured by the Medical Outcomes Study 36-Item Short Form (mean=39.3 [SD=10.6] and 41.9 [SD=12.9], respectively). Over two-thirds of the sample had a primary mental health diagnosis of depression (N=1,390 [69%]), one-fifth met criteria for at-risk drinking (N=414 [20%]), and the remainder were in the dual diagnosis (N=148 [7%]) or anxiety disorder (N=70 [3%]) groups. The diagnostic breakdown of the depression group was major depression (42.5%, N=591), minor depression (17.9%, N=249), dysthymia (5.5%, N=77), depression not otherwise specified (6.1%, N=85), and depression co-occurring with anxiety (27.9%, N=388). The anxiety disorders group consisted of patients with generalized anxiety disorder (75.7%, N=53), anxiety not otherwise specified (18.6%, N=13), and panic disorder (5.7%, N=4). Finally, the dual diagnosis group comprised patients with depression and at-risk drinking (64.2%, N=95); depression, anxiety, and at-risk drinking (29.7%, N=44); and anxiety and at-risk drinking (6.1%, N=9).

Study Intervention

Integrated models met the following minimum criteria for site eligibility: 1) mental health and substance abuse services co-located in the primary care setting (including assessment, care planning, counseling, case management, psychotherapy, and pharmacological treatment), with no distinction in terms of signage or clinic names; 2) mental health and substance abuse services provided by licensed mental health/substance abuse providers (including social workers, psychologists, psychiatric nurses, psychiatrists, and master's-level counselors); 3) verbal or written communication about the clinical evaluation and treatment plan between the mental health and substance abuse clinician and primary care provider; and 4) an appointment with the mental health and substance abuse provider within 2 to 4 weeks following the primary care provider visit. Patients with at-risk drinking were offered a manualized Brief Alcohol Intervention (22).

The minimum criteria for the enhanced referral model included 1) referral within 2 to 4 weeks of the primary care provider appointment; 2) treatment offered in a separate location by licensed mental health and substance abuse professionals; 3) agreement by the specialty mental health/substance abuse clinics to comply with model requirements, including time to first appointment and coordinated follow-up contacts if the patient failed to make the first scheduled visit; 4) assistance with transportation; and 5) facilitated direct or third-party coverage for the costs of the specialty mental health and substance abuse visit.

As anticipated, the profile of providers differed in the two models. Of the patients in the integrated model with at least one treatment visit, approximately three-fifths (60.1% [N=426]) received care from nonphysician mental health clinicians (psychologist, psychiatric social worker, psychiatric nurse, or other nonphysician provider); 35.3% (N=250) received care from a psychiatrist only or psychiatrist with a mental health clinician; and 4.2% (N=30) were treated by a primary care physician alone or primary care physician with a mental health clinician. In contrast, of the patients in the referral model with at least one treatment visit, approximately three-fifths (59.9% [N=299]) received care from a psychiatrist only or psychiatrist with a mental health clinician; 36.7% (N=183) received care from nonphysician mental health clinicians; and 3.4% (N=17) were treated by a primary care physi-

cian alone or primary care physician with a mental health clinician (χ^2=71.48, df=2, p<0.001). For patients in the integrated and referral groups who received treatment following an initial evaluation (N=550 and 314, respectively), there were also modest differences in the type of treatment provided: psychotherapy only (51.6% versus 39.2%), medication management only (20.7% versus 18.2%), medication management combined with psychotherapy (21.1% versus 36.3%), and case management/evaluation (6.6% versus 6.4%) (χ^2=24.65, df=3, p<0.001).

All patients were given an appointment with a mental health and substance abuse provider. The primary care physician was informed of the appointment and encouraged to support the referral. Both models were required to be in place and functioning for at least 6 months prior to patient enrollment to ensure full implementation. Model fidelity and satisfaction of minimum requirements were confirmed by the study coordinating center before randomization and systematically monitored through a detailed process evaluation for each site and through site visits.

Outcome

The dependent variable of treatment engagement was defined as attendance at an appointment with a mental health/substance abuse provider following randomization at the index primary care visit. For every mental health/substance abuse encounter, a check-off treatment tracking form was completed by the clinician or by research assistants by medical record review over the 6-month period of study follow-up. The coordinating center cross-checked data from the treatment tracking form and study completion form and resolved any discrepancies with site data coordinators.

Analyses

Rates of treatment engagement, overall, by site and by key diagnostic and demographic factors were examined by cross-tabulation and computation of odds ratios, based on an intent-to-treat analysis. Multiple logistic regression was used to examine treatment assignment and diagnostic severity as predictors of engagement. Because study populations and treatment models varied somewhat among study sites, a likelihood ratio test for treatment-by-site interaction was performed; site was controlled in all models.
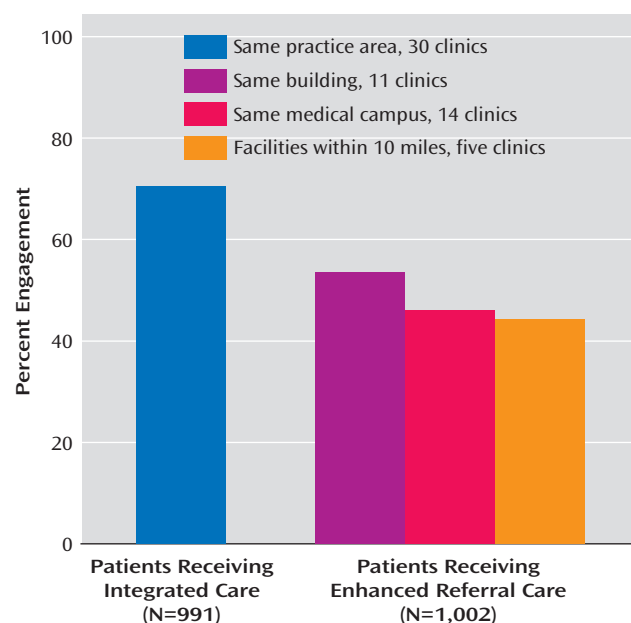
Results

We found a greater rate of treatment engagement among patients randomly assigned to the integrated model (71.0%) than among those assigned to enhanced referral (48.8%), amounting to a 22.2% difference between the two models (odds ratio=2.57, 95% CI=2.14–3.08) (Table 1). Both models had similar proportions of patients with only one mental health/substance abuse visit. However, integrated care patients were more likely to return for subsequent treatment visits: 53.6% had two or more visits compared with 30.4% for the enhanced referral group (χ^2= 112.27, df=1, p<0.001). Overall, the integrated model was also associated with a greater mean number of visits (3.04) compared with the referral model (1.91) (Table 1). The integrated model was associated with a significantly greater number of visits for depression, at-risk alcohol use, and dual diagnosis but not for anxiety disorders.

Figure 2 displays rates of treatment engagement associated with the physical proximity of mental health/substance abuse services to primary care. Rates of engage-

TABLE 1. Treatment Engagement Among Elderly Primary Care Patients Randomly Assigned to Integrated Care or Enhanced Referral Care for Treatment of Depression, Anxiety, or At-Risk Alcohol Use

Treatment Variable	Integrated Care Model (N=999)			Enhanced Referral Model (N=1,023)			Analysis	
	N	%		N	%		χ^2 (df=3)	p
Number of visits							129.2	≤0.001
0	290	29.0		524	51.2			
1	173	17.3		188	18.4			
2	121	12.1		85	8.3			
3	415	41.5		226	22.1			
At least one	709	71.0		499	48.8			
	N	Mean	SD	N	Mean	SD	z	p
Number of visits by diagnosis								
Depression	687	3.50	3.9	703	2.22	3.9	6.15	≤0.001
Anxiety	32	1.81	1.9	38	2.47	3.9	−0.92	0.36
At-risk alcohol use	207	1.42	1.8	207	0.78	2.6	2.85	0.005
Dual diagnosis	73	3.95	4.3	75	1.84	3.1	3.40	0.001
Total	999	3.04	3.7	1023	1.91	3.6	7.00	≤0.001

FIGURE 2. Treatment Engagement by Physical Proximity Between Primary Care and Mental Health/Substance Abuse Clinics[a]

Legend:
- Same practice area, 30 clinics
- Same building, 11 clinics
- Same medical campus, 14 clinics
- Facilities within 10 miles, five clinics

X-axis: Patients Receiving Integrated Care (N=991); Patients Receiving Enhanced Referral Care (N=1,002)
Y-axis: Percent Engagement

[a] Group sizes differ slightly from the total because clinic data are missing on 29 patients.

ment progressively decreased with greater distance between primary care and mental health/substance abuse services for the total sample (χ^2=103.15, df=3, p<0.001) and also among the subset of enhanced referral sites (χ^2=7.76, df=2, p=0.02). The lowest rate of engagement (44.2%) was found for patients referred for mental health/substance abuse services located 1–10 miles from primary care.

The integrated and referral models also differed with respect to time between the primary care physician appointment and time to the first mental health/substance abuse visit attended by the patient. The integrated model was associated with a greater proportion of first visits occurring 0–14 days from randomization (37.4%) compared

with enhanced referral (15.4%) (χ^2=126.09, df=1, p<0.001). The proportion of patients with a first visit within 2–4 weeks of the primary care visit was similar in the integrated model (13.3%) and the referral model (11.8%). Likewise, the proportion of patients with a first visit beyond the 4-week target window was similar for patients in the integrated model (19.8%) and the referral model (21.5%).

Rates of treatment engagement for each of the 10 study sites are shown in Table 2. Rates of engagement were greater for integrated care in nine of the 10 study sites, with rates ranging up to two times greater than those with enhanced referral. However, in one site (Chinatown), the rate of engagement was greater in the referral model. A test for site-by-treatment interaction was statistically significant (G^2=34.07, df=9, p<0.001). When the Chinatown data were set aside, the test for site-by-treatment interaction was no longer statistically significant (G^2=12.70, df=8, p=0.15). Thus, we elected to base subsequent analyses of patient-level characteristics predictive of engagement on the data from the nine sites with consistent results. Similar results were obtained in analyses of all 10 sites.

Table 3 shows rates of engagement by diagnostic category and for subgroups defined by symptom severity. All diagnostic groups achieved higher rates of engagement in the integrated model. Over three-quarters (75.2%) of patients with depression engaged in mental health/substance abuse services in the integrated model compared with approximately one-half (51.5%) in the enhanced referral model. Patients with at-risk drinking were nearly twice as likely to engage in the integrated model (60.4%) relative to enhanced referral (33.0%). Among patients with depression, those with more severe symptoms engaged in care more frequently (64.8%) than did those with less severe symptoms (56.5%). However, the differential rate of engagement between the integrated and referral models was greatest for individuals with milder depression. The largest differential effect for patients in the at-risk drinking category was found in those with problem drinking, who were approximately two-and-a-half times more likely to

TABLE 2. Treatment Engagement by Site Among Elderly Primary Care Patients Randomly Assigned to Integrated Care or Enhanced Referral Care for Treatment of Depression, Anxiety, or At-Risk Alcohol Use

	Integrated Care Model			Enhanced Referral Model			Unadjusted Odds Ratio	95% CI
		Engaged in Treatment			Engaged in Treatment			
Site Type and Location	N	N	%	N	N	%		
Community health centers								
University of California, San Francisco	91	67	73.6	93	31	33.3	5.58	2.96–10.54
Sunset Park	124	95	76.6	127	66	52.0	3.03	1.76–5.21
Chinatown	48	23	47.9	52	36	69.2	0.41	0.18–0.93
Hospital-based network								
Rochester	61	21	34.0	60	15	25.0	1.58	0.72–3.46
University of Pennsylvania	72	59	81.9	74	35	47.3	5.06	2.37–10.75
VA hospitals								
Dartmouth	98	68	69.4	125	61	48.8	2.38	1.37–4.14
Miami	117	101	86.3	134	73	54.5	5.27	2.82–9.88
Chicago	197	132	67.0	170	75	44.1	2.57	1.68–3.93
Philadelphia	102	82	80.4	105	67	63.8	2.33	1.24–4.37
Madison	89	61	68.5	83	40	48.2	2.34	1.26–4.36
Total	999	709	71.0	1,023	499	48.8	2.57	2.14–3.08

TABLE 3. Treatment Engagement by Diagnosis/Condition and Severity Among Elderly Primary Care Patients Randomly Assigned to Integrated Care or Enhanced Referral Care for Treatment of Depression, Anxiety, or At-Risk Alcohol Use[a]

		Integrated Care Model			Enhanced Referral Model			Unadjusted Odds Ratio	95% CI
			Engaged			Engaged			
Clinical Variable	Total N	N	N	%	N	N	%		
Any diagnosis	1922	951	686	72.1	971	463	47.7	2.84	2.35–3.43
Depression	1297	640	481	75.2	657	338	51.5	2.86	2.26–3.61
Anxiety	65	31	22	71.0	34	19	55.9	1.93	0.69–5.40
At-risk drinking	413	207	125	60.4	206	68	33.0	3.09	2.07–4.63
Dual diagnosis[b]	147	73	58	79.5	74	38	51.4	3.66	1.77–7.59
Overall severity[c]									
Mental distress									
Present	1259	608	459	75.5	646	347	53.7	2.65	2.09–3.38
Absent	641	330	218	66.0	311	111	35.7	3.51	2.53–4.85
Suicidal ideation	192	94	78	83.0	98	53	54.1	4.14	2.12–8.08
Death ideation	530	257	182	70.8	273	163	59.7	1.64	1.14–2.35
No ideation	1194	598	424	70.9	596	247	41.4	3.44	2.71–4.38
Depression severity[d]									
Severe	1042	506	383	75.7	536	292	54.5	2.60	2.00–3.39
Less severe	255	134	98	73.1	121	46	38.0	4.44	2.61–7.54
Alcohol use severity[e]									
At risk	157	74	53	71.6	83	24	28.9	6.20	3.10–12.42
Not at risk	256	133	72	54.1	123	44	35.8	2.12	1.28–3.50

[a] Results presented for nine of 10 sites (Chinatown site excluded).
[b] At-risk alcohol use comorbid with depression or anxiety.
[c] Mental distress is the mental health component score from the Medical Outcomes Study 36-Item Short Form. Presence of mental distress is determined by a score below the population normative value of 50. Suicidal ideation is based on the Paykel Scale and consists of active thoughts, plans, or acts by an individual to commit suicide. Death ideation consists of passive thoughts of wanting to be dead.
[d] According to CES-D Scale; cutoff point depicting severe symptoms was score ≥16.
[e] According to Short Michigan Alcohol Screening Test—Geriatric Version; cutoff point depicting at-risk alcohol use was score ≥3.

engage in the integrated model (71.6%) relative to referral care (28.9%). Of note, 83.0% of individuals with active suicidal ideation engaged in mental health/substance abuse treatment in the integrated model compared with 54.1% in the enhanced referral model. Rates of engagement were greater for integrated care for all demographic subgroups, as defined by gender, age, ethnicity, marital status, living status, education, and employment status. There were no demographic differences in overall rate of engagement.

Logistic regression models identifying predictors of engagement are shown in Table 4. Three models are presented, one for all patients combined, another for patients with depression, and another for those with at-risk drinking. For the overall group, assignment to the integrated care

model was strongly associated with a greater likelihood of treatment engagement after we controlled for symptom severity. More severe mental distress was also an independent predictor of engagement. The full sample regression model allowed for a comparison of diagnostic groups. Overall, at-risk alcohol users were less likely to engage in care than depression patients. However, a regression model limited to the subgroup with at-risk drinking found two independent factors predictive of engagement: integrated care and more severe problem drinking as measured by the Short Michigan Alcohol Screening Test—Geriatric Version. Among the subgroup with depression, greater engagement was predicted by assignment to the integrated model and by more severe depression as measured by the CES-D Scale. Demo-

TABLE 4. Predictors of Treatment Engagement Among Elderly Primary Care Patients Randomly Assigned to Integrated Care or Enhanced Referral Care for Treatment of Depression, Anxiety, or At-Risk Alcohol Use[a]

Predictor	Overall		Depression Group		At-Risk Drinking Group	
	Odds Ratio	p	Odds Ratio	p	Odds Ratio	p
Integrated care	3.19	<0.001	3.10	<0.001	4.00	<0.001
Mental distress present[b]	1.58	0.001	—		—	
Drinking[c]	0.59	0.001	—		—	
Anxiety[c]	1.25	0.44	—		—	
Severe depression[d]	—		1.42	0.02	—	
At-risk alcohol use[e]	—		—		1.86	0.01

[a] All logistic regression models control for site. Results presented for nine of 10 sites (Chinatown site excluded). Empty cells with dashes indicate that variable was not entered into regression because it was not collected for the subgroup (e.g., Short Michigan Alcohol Screening Test—Geriatric Version for depression group) or due to multicolinearity (e.g., mental distress and depression).
[b] Mental distress is the mental health component score from the Medical Outcomes Study 36-Item Short Form. Presence of mental distress is determined by a score below the population normative value of 50.
[c] Binary variables coding the target conditions (depression is the referent).
[d] Score ≥16 on the CES-D Scale.
[e] Score ≥3 on the Short Michigan Alcohol Screening Test—Geriatric Version.

graphic variables and medical severity were not associated with treatment engagement and thus were not included in regression models.

Additional regression analyses were conducted examining specific interactions of treatment model with diagnosis for the regression including the total patient sample, and separately for the interaction of treatment model with symptom severity for the depression and at-risk alcohol use subgroups. The only interaction approaching significance was between problem drinking severity (Short Michigan Alcohol Screening Test—Geriatric Version) and model assignment (likelihood ratio test: $\chi^2=3.6$, p=0.07). Although bivariate analyses indicated that individuals with less severe depression symptoms were less likely to engage in referral care, this interaction was not significant in the multivariate model.

Discussion

This study shows that integrated mental health/substance abuse services in primary care settings result in substantially greater treatment engagement by older patients compared with referral to specialty mental health/substance abuse clinics under enhanced conditions. Despite enhancing the system of referral by ensuring timely appointments, transportation, and payment for services, less than half (49%) of older persons engaged in services in the enhanced referral model compared with over two-thirds of patients (71%) engaging in the integrated model. Superior rates of engagement in the integrated model

were found in nine of 10 sites despite significant differences across sites with respect to organization, financing, practice setting, and patient ethnicity. Separate service delivery systems for mental health and general health care have been cited as a major barrier to mental health care for older persons (7). Integrated care has been advocated as a means to enhance communication between providers, reduce stigma and medical expenditures, and avoid artificial separation of medical and psychiatric problems that can result in substandard care (23).

Differential rates of engagement between integrated and enhanced referral models were largely explained by the proportions of patients with two or more mental health/substance abuse visits, underscoring that differences in engagement were associated with substantive care episodes rather than single clinical contacts. In addition, patients assigned to integrated care were more likely to have first appointments within 2 weeks of the primary care visit, demonstrating enhanced access to timely treatment.

An important finding relates to the role of physical proximity of mental health/substance abuse services to primary care in predicting treatment engagement. Greater distance between primary care and mental health/substance abuse services was associated with declining rates of engagement. This relationship was found for the total study sample, including the integrated model in which physical proximity of mental health/substance abuse services in the primary care setting was an attribute of the model. In addition, greater distance was associated with lower rates of engagement when only considering the subgroup of patients in the referral model, in which there was a range of distances between mental health/substance abuse services and the primary care setting. Of note, the one site with greater rates of engagement in the referral model (Chinatown) provided mental health/substance abuse services in the same building as the primary care clinic and had a 30-year relationship of working together in a well-functioning arrangement of receiving and coordinating referrals. Hence, a small distance between mental health and primary care clinics and established patterns of coordination may have favored engagement in the referral model at the Chinatown site. Overall, these findings suggest that integration of mental health and primary health care may be most accurately described along a multidimensional continuum, rather than a dichotomy. In this respect, integration might be appropriately characterized along different dimensions such as the degree of physical proximity, temporal proximity, communication between providers, collaboration in treatment planning, range of available mental health services, and degree of common financing and billing for mental health and medical care.

Logistic regression modeling identified both patient-level and service model factors associated with engagement. For the overall sample, older primary care patients

who were more distressed and who did not have at-risk alcohol use were more likely to engage in mental health and substance abuse services. However, among older adults in the at-risk alcohol use subgroup, greater engagement was associated with a higher degree of alcohol-associated problems. Finally, within the depression subgroup, greater engagement was independently associated with more severe depression. Overall, integrated services were the most important determinant of engagement in care for each diagnostic group, suggesting that the model of service delivery is a crucial determinant of use of mental health/substance abuse services by older primary care patients.

Of interest, the integrated model was particularly beneficial in engaging individuals with at-risk alcohol use. The largest difference in rates of engagement was found among those with greater severity of problem drinking. This finding is underscored by a tendency toward a model-by-diagnosis interaction. This suggests that older adults with at-risk alcohol use may be more likely to follow-through with brief alcohol assessment and treatment with a provider who is integrated into the primary care setting than with a referral to a specialty clinic.

A surprisingly high rate of engagement was also found in the integrated model for older adults with active suicidal ideation (83%). Epidemiological studies indicate that older adults have the highest rate of suicide among any age group (24), and 70% of older persons visit their primary care physician within a month of committing suicide (25). These findings suggest that integrated care may be effective in engaging older primary care patients who are at-risk for suicide.

Several caveats are indicated in interpreting the results of this study. First, study participants were limited to those who consented to random assignment; therefore rates of engagement do not necessarily generalize to the entire population of older primary care patients. An analysis of screening data found that individuals who declined participation were more likely to be male and Caucasian, had less severe General Health Questionnaire scores, and had greater alcohol use. At the same time, generalization of the study findings is substantially enhanced by the inclusion of a large, ethnically diverse sample of older adults from a wide range of practice settings. Second, this report compares rates of engagement between treatment models but does not address clinical outcomes associated with these models. Finally, rates of engagement were compared between integrated care and an enhanced system of referral care. Hence, it is likely that our study underestimates the difference in engagement between integrated care and routine systems of referral care that do not include enhancements such as timely appointments, assistance with transportation, and facilitated coverage for the costs of the specialty mental health and substance abuse visit.

Results from this study confirm that older primary care patients are more likely to accept collaborative mental health treatment within primary care settings than in mental health and substance abuse specialty clinics. As older adults have the lowest use of mental health and substance abuse services compared with any other adult age group, this study provides empirical support for health policy reform recommendations aimed at improving access to coordinated psychiatric and medical services by fostering integrative relationships between mental health and primary care sectors (26).

Acknowledgments

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