Alcohol, Other Drugs, and Health: Current Evidence

NOV-DEC 2007

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Health Outcomes

Does Prescribing Opioids for Chronic Noncancer Pain Contribute to Opioid Use Disorders?

Does opioid abuse or dependence result from the prescription of opioids for chronic noncancer pain? If so, are there discernable risk factors?

To answer these questions, researchers analyzed demographic and clinical data from 15,160 veterans with chronic opioid use (>90 day prescription) for noncancer pain but no opioid abuse or dependence diagnosis noted in their medical records in 2000–2002. Researchers then compared those veterans with a subsequent diagnosis of an opioid use disorder in 2003–2005 with veterans without this diagnosis in the same period.

In 2002, 45% of veterans had a mental health diagnosis; 8% had a diagnosis of a nonopioid substance use disorder. Two percent of veterans were subsequently diagnosed with opioid abuse or dependence. In adjusted analyses, veterans with the following in 2002 were more likely to have been diagnosed with opioid abuse or dependence in 2003–2005:

- nonopioid substance use disorder (OR, 2.3)
- mental health disorder (OR, 1.5)
- greater number of outpatient healthcare visits (OR, 1.5 for 20+ visits versus 0–6 visits)
- greater number of days supplied with opioids (OR, 1.8 for 211+ days versus 91–150 days)

Comments: This study clearly identified only those individuals whose unhealthy opioid use came to medical attention over 1–3 years. However, the modest proportion of patients who received regular opioids for chronic noncancer pain and later developed abuse or dependence suggests that opioid treatment generally may have a favorable benefit-risk ratio. Although the majority of those at risk for opioid problems may not subsequently develop them, knowledge of risk factors can alert clinicians to those who are more susceptible.

Jeffrey H. Samet, MD, MA, MPH

Reference: Edlund MJ, et al. Risk factors for clinically recognized opioid abuse and dependence among veterans using opioids for chronic non-cancer pain. *Pain.* 2007;129(3):355–362.

Cannabis Use May Lead to Later Psychosis

Cannabis intoxication can produce transient psychotic and affective symptoms. Whether cannabis use leads to the development of subsequent psychosis or affective symptoms is less clear. After searching the medical literature, researchers systematically identified and reviewed 35 longitudinal studies that examined the incidence of psychosis or affective symptoms among cannabis users.

- Subjects who had ever used cannabis had a higher risk of developing psychosis than did nonusers (pooled adjusted odds ratio [OR], 1.4).
- All 6 studies reporting on cannabis frequency found a dose-response relationship between cannabis use and psychosis (pooled adjusted OR, 2.1 for the most frequent cannabis users

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Alcohol, Other Drugs, and Health: Current Evidence **is a project of the Boston Medical Center, supported by the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism, and produced in cooperation with the Boston University Schools of Medicine and Public Health.**

Cannabis Use and Psychosis (continued on from page 1)

versus nonusers).
- In the 8 studies that examined cannabis use frequencies, frequent cannabis users had a higher risk of developing depressive symptoms than did nonusers (pooled adjusted OR, 1.5).
- In studies that examined a depression diagnosis, suicidal ideation or attempts, or anxiety outcomes, there was no significant association between cannabis use and these outcomes.

Comments: The positive association between cannabis use, particularly frequent use, and the development of psychosis is consistent across longitudinal studies, whereas the association between cannabis use and affective symptoms is largely mixed. Clinicians should inform patients that cannabis use may increase the risk of future psychotic illness.

Alexander Y. Walley, MD, MSc

Reference: Moore THM, et al. Cannabis use and risk of psychotic or affective mental health outcomes: a systematic review. *Lancet*. 2007; 370 (9584):319–328.

Prevalence and Impact of Methamphetamine Use Among Trauma Patients

Patients using methamphetamine can experience adverse physical and medical consequences resulting in emergency department use and hospitalization. To assess the prevalence and impact of methamphetamine use among trauma patients, researchers surveyed the records of 4932 (76%) patients who were seen in a Level I trauma center in San Diego between 2003–2005 and who underwent a urine toxicology screening during their visit.

The rate of methamphetamine use (defined as a positive urine screen), but not other illicit drug use, increased from 2003 to 2005 (from 9% to 15%). In analyses adjusted for other drug use, age, sex, and injury severity, patients with (versus without) a methamphetamine-positive urine screen were more likely to have

- been injured in a violent way (e.g., gunshot wound, stab wound) (odds ratio [OR], 2.0);
- attempted suicide (OR, 1.7);
- been a victim of domestic violence (OR, 2.5);
- required more medical care (e.g., one or more operations [OR, 1.5], mechanical ventilation [OR, 1.6]);
- died from their injuries (OR, 2.3).

Comments: This study documents the change in the epidemiology of methamphetamine use in southern California over a recent 3-year period. In regions where methamphetamine use is common (e.g., West, Midwest of the U.S.), emergency departments and trauma centers can expect to see a consistent flow of patients using the drug. Identification via urine toxicology screening plus access to addiction treatment services may help change the trajectory of methamphetamine use in these high-prevalence areas.

David A. Fiellin, MD

Reference: Swanson SM, et al. The scourge of methamphetamine: impact on a Level I trauma center. *J Trauma*. 2007;63(3):531–537.

How Often Are Substance Use Disorders Diagnosed in Outpatient Settings?

Providing screening, assessment, and care for substance abuse in general medical settings has the potential to reach many people who might not otherwise have access to treatment. Yet, rates of treatment are low in these settings, despite an estimated substance abuse prevalence of 2%–9% among primary care patients.

Researchers in this study aimed to identify patient characteristics associated with receiving a diagnosis of substance abuse or dependence. They analyzed data from a random selection of office-based physicians who reported their diagnosing practices as part of a national survey (60,238 surveys analyzed).

- From 1997 to 2004, diagnoses of substance use disorders were recorded at 0.9% of family practice visits, 0.8% of internal medicine visits, and 5.1% of psychiatry visits.
- Women, the elderly, and patients seen for an acute condition were significantly less likely than others to have a substance use disorder diagnosis noted, regardless of physician specialty.

Comments: The rate at which generalist physicians record substance abuse diagnoses is substantially lower than the actual prevalence of these conditions as defined by national surveys. Although the actual prevalence of substance abuse in these physicians' practices is unknown, this study's findings support the argument that more widespread implementation of substance abuse screening and assessment in primary care settings could identify many more people who could benefit from attention to these conditions.

Marc N. Gourevitch, MD, MPH

Reference: Banta JE, et al. Substance abuse and dependence treatment in outpatient physician offices, 1997–2004. *Am J Drug Alcohol Abuse.* 2007;33(4):583–593.

Smoking Among Patients With Alcohol or Drug Use Disorders

The prevalence of smoking is much higher in people with alcohol or drug use disorders. However, neither the specific relationship between smoking and alcohol or drug use nor the impact of gender on this relationship is clearly understood. Therefore, researchers analyzed data from a nationally representative sample of 42,565 U.S. adults who participated in a survey on alcohol and related conditions.

- Prevalence of daily smoking was 21% among the total sample, 40% among people with a current alcohol use disorder (abuse or dependence), and 55% among people with a current drug use disorder.
- Ex-smokers composed about 20% of the total sample, 13% of people with a current alcohol use disorder, and 8% of people with a current drug use disorder.
- The likelihood of daily smoking, versus never smoking, was highest among women with a current drug use disorder (odds ratio [OR], 6.5), followed by men with a current drug use disorder (OR, 4.6), women with a current alcohol use disorder (OR, 3.5), and men with a current alcohol use disorder (OR, 2.9) (all significant results).

Comments: Smoking is highly prevalent among people with alcohol or drug use disorders, and quitting smoking is difficult for such patients. Regardless, to help prevent additional smoking-associated morbidity, clinicians should conduct screening and offer appropriate treatment for nicotine dependence for patients with substance use disorders.

Julia H. Arnsten, MD, MPH

Reference: Husky MH, et al. Gender differences in association with substance use diagnoses and smoking. *J Addict Med*. 2007;1(3):161-164.

Mechanical Ventilation in Medical Inpatients With Alcohol Use Disorders

Whether alcohol use disorders increase the need for and duration of mechanical ventilation in hospitalized medical patients is unknown. Using a national inpatient database, researchers retrospectively measured the association between mechanical ventilation and alcohol use disorders and alcohol withdrawal in 785,602 adult inpatients with 1 or more of 6 medical diagnoses: pneumonia, sepsis, gastrointestinal hemorrhage, asthma, chronic obstructive pulmonary disease, and respiratory failure. Analyses were adjusted for potential confounders (e.g., age, severity of illness).

- Three percent of inpatients had an alcohol use disorder, 0.5% had alcohol withdrawal, and 8% required mechanical ventilation.
- Mechanical ventilation was significantly more common among inpatients with, versus without, an alcohol use disorder (odds ratio, [OR], 1.5), regardless of medical diagnosis. The association between mechanical ventilation and alcohol withdrawal was not reported.

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Mechanical Ventilation in Medical Inpatients With Alcohol Use Disorders (continued from page 3)

- Longer duration of mechanical ventilation (≥96 hours) was not significantly more common among inpatients with alcohol use disorders. However, it was more likely among inpatients with (versus without) alcohol withdrawal (OR, 1.5).

Comments: In this large study, alcohol use disorders were associated with increased use of mechanical ventilation, and alcohol withdrawal was linked with a longer duration of mechanical ventilation. Clinicians should carefully assess medical inpatients for alcohol use and monitor for withdrawal and change in respiratory status. However, because the initial timing of intubation (e.g., in the emergency department, the first hospital day) was not tracked, the study was unable to determine whether medical inpatients with alcohol use disorders and 1 of the 6 diagnoses should be initially triaged to higher levels of care.

Kevin L. Kraemer, MD, MSc

Reference: De Wit M, et al. Alcohol use disorders increase the risk for mechanical ventilation in medical patients. *Alcohol Clin Exp Res*. 2007;31(7):1224–1230.

Alcohol and Colorectal Cancer

Researchers in this study from Europe aimed to better understand the relationship between alcohol consumption and colorectal cancer (CRC). They assessed alcohol use in 478,732 subjects without cancer at study enrollment. They followed up these subjects for approximately 6 years, during which 1833 cases of CRC were reported. Findings from analyses adjusted for potential confounders (e.g., age, weight, energy intake) include the following:

- The risk of CRC significantly increased as drinking increased above approximately 0.5 drinks per day. Hazard ratios (HRs) ranged from 1.05 for a lifetime usual intake of about 0.5–1 drink per day to 2.0 for >5 drinks per day.
- The risk of CRC associated with baseline beer intake (HR, 1.4 for about 1.5–3 versus <0.25 drinks per day) was higher than the risk associated with wine intake (HR, 1.2 for the same amounts), although the two risk estimates were not significantly different.
- The risk associated with baseline alcohol use was higher among those with low folate intake (HR, 1.1 for an increase of about 1 drink per day) than among those with high folate intake (HR, 1.03, a borderline significant finding).

Comments: Like a number of other recent studies, this large, multi-country epidemiologic study suggests an increased risk of colorectal cancer from alcohol intake, primarily at higher intakes. The risk was not as high among drinkers of smaller amounts or subjects with higher intakes of folate. Individuals drinking within current U.S. recommendations for moderate use (≤2 drinks for men and ≤1 for women) may have a minimal increase in CRC risk that could possibly be attenuated by adequate folate intake.

R. Curtis Ellison, MD

Reference: Ferrari P, et al. Lifetime and baseline alcohol intake and risk of colon and rectal cancers in the European Prospective Investigation into Cancer and Nutrition (EPIC). *Int. J. Cancer.* 2007;121(9):2065–2072.

Impact of Dronabinol and Marijuana in Patients With HIV

Marijuana use for medical purposes is controversial. The oral form of dronabinol, the active ingredient in marijuana, is approved by the FDA to treat anorexia in patients with AIDS and for prophylaxis against nausea and vomiting in patients about to receive chemotherapy.

Researchers sought to assess the effects of oral dronabinol (5 and 10 mg 4 times per day) and smoked marijuana (2% and 3.9% THC 4 times per day) on appetite, mood, cognition, and sleep in 10 people with HIV. Each subject experienced all of the cannabinoid conditions plus a placebo condition.

- Both oral dronabinol (10 mg only) and smoked marijuana, versus placebo, produced intoxication and positive subjective effects (e.g., feeling mellow). Neither oral dronabinol nor smoked marijuana, at any concentration, impaired cognitive performance.
- Both oral dronabinol and smoked marijuana, versus placebo, increased daily caloric intake. The higher concentrations of both dronabinol and smoked marijuana also increased body weight.
- The higher concentration of marijuana improved sleep ratings.

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Impact of Dronabinol and Marijuana in Patients With HIV (continued from page 4)

Comments: This study found similar effects of dronabinol and marijuana on caloric intake and weight in patients with HIV. The increases in weight were seen within 4 days of starting the dronabinol or marijuana. It is important to note that the dose of dronabinol used in this study was 8 times the standard recommendations. These findings provide support for the use of dronabinol for improving appetite and weight but at doses that caused intoxication.

David A. Fiellin, MD

Reference: Haney M, et al. Dronabinol and marijuana in HIV-positive marijuana smokers: caloric intake, mood, and sleep. *J Acquir Immune Defic Syndr*. 2007;45(5):545–554.

Late Nights and Drinking, Even Moderate Amounts, Impair Driving

Alcohol use and sleepiness are both risk factors for driving injuries and fatalities. Researchers in this study examined how the combination of drinking and sleepiness influenced driving performance in 29 young adults.

Subjects stayed awake several hours after usual bedtime and consumed, over 30 minutes 1 hour before usual bedtime, vodka* on one night and placebo on another. They completed driving simulation and visual reaction time tasks before and after consuming the alcohol or placebo. Analyses were adjusted for potential confounders (e.g., previous sleep history).

- Performance on the driving simulation task significantly deteriorated as the time awake increased. Alcohol exacerbated the effects of wakefulness on certain driving simulation tasks, particularly at hour 15.5 of wakefulness (when alcohol levels peaked) but not at hour 18.5.
- Reaction time also deteriorated with increasing time awake, but was not significantly affected by alcohol consumption (compared with placebo).

Comments: In this study, drinking on top of sleep deprivation decreased driving performance. But, drinking did not appear to exacerbate sleep deprivation's effects on reaction time. By 18.5 hours of wakefulness, the effects of sleepiness apparently superseded any alcohol effects.

This study provides additional evidence that in sleep-deprived young people, the rapid consumption of even a moderate amount of alcohol may further impair driving. The potential effects of less-rapid consumption of alcohol or of eating food in conjunction with alcohol intake were not tested.

R. Curtis Ellison, MD

*0.54 g/kg for men; 0.49 g (mixed with tonic)/kg for women

Reference: Rupp TL, et al. Effects of a moderate evening alcohol dose. II: Performance. *Alcohol Clin Exp Res.* 2007;31(8):1365–1371.

Assessments and Interventions

Screening and Brief Interventions for Unhealthy Alcohol Use in Adults: Mixed Results

Screening and brief intervention are effective for helping some heavy drinkers without alcohol dependence to reduce their alcohol consumption. Two new studies clarify that setting and severity of alcohol use may influence who will benefit.

In one randomized trial, researchers implemented alcohol screening by questionnaire in 39 primary care practices in Denmark. Patients who screened positive for risky drinking (>21 drinks per week for men; >14 for women) but did not have screening scores consistent with alcohol dependence received either no intervention or 10 minutes of counseling by trained physicians and a recommendation for a follow-up consultation.

- Of 7691 unique patients able to be screened (e.g., not inebriated, pregnant, acutely ill), 10% refused screening; 16% of those screened had risky drinking.
- Only 18% of the intervention group returned for the follow-up consultation.
- After 1 year (61% response rate), the usual number of drinks per week did not significantly differ between the intervention and control groups.

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Screening and Brief Interventions: Mixed Results (continued from page 5)

- Furthermore, women in the intervention group had a significant *increase* in binge drinking.

In another study, researchers in Scotland identified 215 inpatients in a general hospital who drank excessively but did not have alcohol dependence (according to written self-report). These inpatients were randomized to receive 20 minutes of self-efficacy counseling by an experienced mental-health nurse, a self-help booklet on sensible drinking, or usual care.

- At the 6-month follow-up, weekly drinking had significantly decreased in both intervention groups.
- The decreases were similar in both groups.

Comments: Practice guidelines recommend that primary care clinicians conduct screening and brief counseling for their patients with nondependent heavy drinking. However, implementation is challenging, efficacy can be modest or nonexistent, and harm is possible, as suggested by the primary care study above.

Evidence for efficacy of brief in-hospital interventions has been mixed (particularly when patients with dependence, who compose a substantial proportion of screen-positive inpatients, are included). This latest trial in inpatients will not settle the question, but it does suggest that even written information can help, at least for drinkers without dependence.

Richard Saitz, MD, MPH

References: Beich A, et al. Screening and brief intervention targeting risky drinkers in Danish general practice: a pragmatic controlled trial. *Alcohol Alcohol.* 2007;42(6):593–603. Holloway AS, et al. The effect of brief interventions on alcohol consumption among heavy drinkers in a general hospital setting. *Addiction.* 2007;102(11):1762–1770.

Brief MI in Emergency Rooms Reduces Problem Drinking in Young Adults

American adults aged 18 to 25 years have the highest rates of alcohol consumption, problem drinking, and alcohol-related traumatic fatalities. In this study, researchers sought to determine whether a brief motivational interview in the emergency department could reduce drinking and subsequent harm.

They randomized 198 young-adult, emergency-department patients with a positive alcohol screen* to receive either (1) a session of motivational interviewing (MI) with a counselor that included personalized written feedback or (2) feedback only. Both groups received a booster telephone call 1 and 3 months later.

At the 12-month follow-up (81% response rate) and in adjusted analyses, the MI group, compared with the feedback only group,

- drank on fewer days in the past month (4.5 versus 6.5);
- had fewer heavy drinking days (≥5 drinks in a day for men, ≥4 for women) in the past month (2.7 versus 3.5);
- drank fewer drinks per week in the past month (6.1 versus 8.8).

Both groups had fewer driving violations and alcohol-related injuries, and were more likely to seek alcohol treatment at follow-up. However, no differences between groups were detected.

Comments: "Near misses" and other nonfatal events that lead young people to seek emergency care represent "teachable moments" that could lead to lasting behavioral change. Without a no-intervention control group, this study could not determine whether these low-intensity interventions reduced harms beyond the assessments or the events themselves; therefore, the findings beg replication.

However, brief counseling appeared to have helped young adults to reduce their drinking. Insofar as reduced problem drinking is a worthwhile goal for young people, these findings suggest that recent mandates for brief interventions in trauma centers merit consideration for young adults in other emergency settings.

Peter D. Friedmann, MD, MPH

*Blood alcohol concentration of >0.01%, reported drinking alcohol in the 6 hours before the event that caused their visit, or a score of ≥8 on the Alcohol Use Disorders Identification Test

Reference: Monti PM, et al. Motivational interviewing versus feedback only in emergency care for young adult problem drinking. *Addiction.* 2007;102(8):1234–1243.

PRN Nalmefene: Can It Reduce Heavy Drinking?

Opioid antagonists may have a role in treating alcohol dependence. But, the optimal setting (primary care versus specialty treatment) and dosing regimen (scheduled versus as-needed [PRN]) are unclear.

Researchers in Finland randomized 403 heavy drinkers* from various sites (e.g., specialty treatment, private general practice) to the long-acting opioid antagonist nalmefene (10–40 mg) or to placebo to be taken PRN 1–2 hours before expected alcohol use. After 28 weeks, good responders in the nalmefene group were randomized to continue on nalmefene or to placebo for an additional 24 weeks.

- Sixty percent of the nalmefene group and 68% of the placebo group completed the initial 28 weeks. On average, the nalmefene group took a pill on 35% of days, and the placebo group took a pill on 44% of days.
- Over the initial 28 weeks, the risk of heavy drinking days (HDDs)** was 32% lower in the nalmefene group than in the the placebo group.
- Among good responders to nalmefene at 28 weeks, those who continued nalmefene had a lower mean proportion of HDDs than did those who switched to placebo (18% versus 30%).
- The most common side effects of nalmefene were nausea, insomnia, fatigue, and dizziness.

Comments: This research focused on harm reduction; subjects were not given specific abstinence or drinking goals and received minimal psychosocial intervention. In this context, PRN nalmefene showed promise for reducing heavy drinking days. The PRN schedule for nalmefene is intriguing. It would be interesting to learn more about the reasons for which individual subjects used the drug (e.g., to stem craving, to limit the number of drinks in a drinking session).

Kevin L. Kraemer, MD, MSc

*Self-reported difficulty controlling drinking plus at least 18 heavy drinking days and no more than 14 consecutive abstinent days in the last 12 weeks.
**≥5 drinks per day for men, ≥4 for women

Reference: Karhuvaara S, et al. Targeted nalmefene with simple medical management in the treatment of heavy drinkers: a randomized double-blind placebo-controlled multicenter study. *Alcohol Clin Exp Res*. 2007;31(7):1179–1187.

Training Improves Generalist Physicians' Confidence in Treating Opiate Misuse

Training is a common component of initiatives that advocate greater involvement of generalist physicians (GPs) in treating opiate use disorders. British researchers measured the effectiveness of training GPs to change knowledge, attitudes, and clinical practices around opiate disorders.

Sixty-three GPs were randomized to a 6-month training certificate course; 49 were randomized to a waiting list control (20 of whom bypassed the waiting list and completed the course by paying for it themselves). All GPs were interviewed at study enrollment and 6 months later. Intent-to-treat analyses (i.e., subjects are analyzed in the groups to which they were randomized) suggested the following:

- Both groups showed similar improvements in knowledge.
- The proportion who were "very confident" in prescribing methadone for maintenance increased significantly in both groups, but moreso in the intervention group (from 33% to 72% versus 31% to 55% for the controls).
- The proportions who saw patients who misused opiates (about 90% in both groups at enrollment) and prescribed methadone to these patients did not significantly change in either group. However, these behaviors increased in the intervention group but decreased in controls.

Results were similar in analyses that compared subjects who received training (including those who bypassed the waiting list) with subjects who did not receive training, though the former had significantly greater improvements in knowledge.

Comments: Even though the level of interest in treating drug use was high and subject to ceiling effects and the control group was contaminated with GPs who paid for their own training, this rigorous study still found positive effects of training on physicians' confidence. Abundant theoretical and empirical work suggests that such confidence is key to physicians' involvement in the care of substance use disorders. These findings are reassuring in light of the ongoing training initiative to promote the dissemination of office-based buprenorphine maintenance in the U.S.

Peter D. Friedmann, MD, MPH

Reference: Strang J, et al. What difference does training make? A randomized trial with waiting-list control of general practitioners seeking advanced training in drug misuse. *Addiction.* 2007;102(10):1637–1647.

Feasibility of a Smoking Cessation Intervention in Substance Abuse Treatment Programs

Patients in treatment for substance use disorders have a high prevalence of smoking. Treating nicotine dependence in substance abuse treatment settings, however, is uncommon.

Researchers in this study evaluated the feasibility of implementing a smoking cessation intervention in substance abuse treatment programs. They surveyed, as part of a randomized trial, the program directors, research directors, and 1442 patients from 13 different sites.

- Smoking prevalence was 76%. It was higher at sites that provided methadone (87% versus 66% at sites without methadone) and at sites located in a setting with medical services (85% versus 63% at sites without medical services).
- Most (78%) smokers were interested in quitting, and 64% were willing to enroll in smoking cessation treatment. Interest in quitting and willingness to enroll in smoking cessation treatment were both more common at the sites that provided methadone (e.g., 77% versus 48% willing to enroll) and at sites located in a setting with medical services (e.g., 73% versus 45% willing to enroll).
- Obstacles to performing a smoking cessation intervention identified by sites included the time commitment by staff and scheduling conflicts and low motivation among patients.

Comments: Smoking is highly prevalent among patients in substance abuse treatment. Although barriers to implementing smoking cessation interventions may exist, these patients, particularly those receiving methadone, are very interested in quitting smoking. Methadone maintenance programs may offer a unique means of integrating nicotine dependence treatment with substance abuse treatment.

Julia H. Arnsten, MD, MPH

References: Reid MS, et al. Implementation of a smoking cessation treatment study at substance abuse rehabilitation programs: smoking behavior and treatment feasibility across varied community-based outpatient programs. *J Addict Med.* 2007;1(3):154–160.

The major journals regularly reviewed for the newsletter include the following:

Addiction
Addictive Behaviors
AIDS
Alcohol
Alcohol & Alcoholism
Alcoholism: Clinical & Experimental Research
American Journal of Drug & Alcohol Abuse
American Journal of Epidemiology
American Journal of Medicine
American Journal of Preventive Medicine
American Journal of Psychiatry
American Journal of Public Health
American Journal on Addictions
Annals of Internal Medicine
Archives of General Psychiatry
Archives of Internal Medicine
British Medical Journal
Drug & Alcohol Dependence
Epidemiology
Journal of Addiction Medicine
Journal of Addictive Diseases
Journal of AIDS
Journal of Behavioral Health Services & Research
Journal of General Internal Medicine
Journal of Studies on Alcohol
Journal of Substance Abuse Treatment
Journal of the American Medical Association
Lancet
New England Journal of Medicine
Preventive Medicine
Psychiatric Services
Substance Abuse
Substance Use & Misuse
Many others periodically reviewed
(see www..aodhealth.org)

Contact Information:
Alcohol, Other Drugs, and Health: Current Evidence
Boston University School of Medicine/Boston Medical Center
91 East Concord Street, Suite 200
Boston, MA 02118
aodhce@bu.edu