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NO. 53014-7-II

IN THE COURT OF APPEALS OF THE STATE OF WASHINGTON  
DIVISION TWO

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STATE OF WASHINGTON,

Respondent,

v.

TOMMIE TUCKER,

Appellant.

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ON APPEAL FROM THE SUPERIOR COURT OF THE  
STATE OF WASHINGTON FOR PIERCE COUNTY

The Honorable Frank Cuthbertson, Judge

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BRIEF OF APPELLANT

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A. ASSIGNMENTS OF ERROR

1. The trial court abused its discretion in denying appellant Tommie Tucker's request for a prison-based drug-offender sentencing alternative (DOSA) on the impermissible basis of Tucker's age.

2. The trial court erred in imposing costs of collecting unpaid legal financial obligations (LFOs).

3. The trial court erred by imposing interest nonrestitution LFOs.

Issues Pertaining to Assignments of Error

1. Is reversal of Tucker's sentence necessary, where the trial court abused its discretion in denying Tucker's request for a prison-based DOSA on the impermissible basis of Tucker's age?

2. Where Tucker was indigent at the time sentencing, must the discretionary costs of collecting unpaid LFOs be stricken from the judgment and sentence?

3. Given recent statutory amendments, must the provision imposing interest on nonrestitution LFOs be stricken from the judgment and sentence?

B. STATEMENT OF THE CASE

The State charged Tucker with one count of unlawful possession of a stolen vehicle. CP 3; RCW 9A.56.068. Tucker waived his jury trial right and proceeded to a bench trial. CP 7; RP 13-14.

The State's evidence showed Mesa Winter's 1997 red Subaru Legacy was stolen sometime between July 2 and July 3, 2018. RP 28-29. The Subaru already had body damage and was missing the passenger side mirror. RP 29-31. A police officer contacted Tucker sleeping in the Subaru on August 2, 2018. RP 41, 46-47. The front and back license plates on the vehicle did not match each other, and neither matched the vehicle identification number. RP 42-43. The ignition was punched and screwdriver on the driver side floorboard started the vehicle. RP 55-56, 58-59.

Tucker maintained he did not know the vehicle was stolen. RP 74. Tucker was homeless at the time. RP 66-68. He began a romantic relationship with a woman, Yolanda Carey, in summer of 2018, who was also homeless. RP 68-70. Carey explained to Tucker she purchased the car—cheaply, because of the punched ignition. RP 71-72, 75. She offered for Tucker to stay with her in the car. RP 68-69. Carey went to jail in July, so Tucker drove the car, only once, to his sister's house, for safekeeping. RP 70-71, 76-77. Tucker had been sleeping in the vehicle

for four nights preceding his arrest. RP 78. He did not notice the mismatched license plates. RP 76.

The trial court found Tucker guilty as charged—finding that he knowingly retained or possessed a stolen vehicle belonging to Winter. RP 100-01 (oral ruling); CP 9-10 (written ruling). The court ordered the Department of Corrections (DOC) to screen Tucker for a prison-based drug-offender sentencing alternative (DOSA). CP 12. In his self-evaluation, Tucker reported daily use of alcohol and methamphetamine, and believed it was extremely important that he get treatment. CP 16.

Tucker has a long criminal history, consistently mostly of drug- and poverty-related misdemeanor offenses. CP 23-26; RP 110. With Tucker’s offender score of 9+, the standard range sentence for possession of a stolen vehicle is 43 to 57 months. CP 26. The parties proceeded to sentencing on December 21, 2018. RP 108.

Tucker requested a prison-based DOSA, which would consist of 25 months in prison and 25 months on community custody. RP 111-13; RCW 9.94A.662(1). Defense counsel noted that, while Tucker had previous treatment opportunities, he had never had a DOSA before, despite his lengthy struggle with substance abuse. RP 111-12. Counsel explained Tucker hoped to achieve long-term sobriety, which “[a]t his age, at 50 years old, that’s becoming even more important with every passing

year.” RP 113. Tucker also addressed the court, admitting, “my past speaks for itself.” RP 113-14. Tucker understood what was involved with a DOSA and was ready to finally address his addiction. RP 113-14.

The State opposed Tucker’s request for a DOSA, pointing to Tucker’s lengthy criminal history and his prior treatment opportunities. RP 110-11; CP 52. By the State’s summary, Tucker received community treatment in 2009 (“Breaking the Cycle”); was ordered to complete a substance abuse evaluation and treatment in 2006 and 2008 cases; and had inpatient treatment recommended in 1996. RP 110-11; CP 52.

Without any analysis or explanation, the trial court ruled, “Yeah. I’m not going to do the DOSA. I’m going to do the low end, 43 months.” RP 114. Tucker again asked to address the court, imploring, “This is what happened all the time I ask for help, I never get it. I’m always given prison time. I mean, I can’t beg you guys for help. I can only ask --.” RP 114. The court inquired about Tucker’s prior treatment opportunities, which Tucker acknowledged, but explained each time he never received treatment in prison. RP 115-16.

The court then asked, “How old are you?” RP 116. Tucker responded, “I’m 50 Christmas Day,” four days from sentencing. RP 116. Tucker explained his attempt to get his life back on track, followed by

relapse. RP 116. The court essentially ignored Tucker, stating only, “Okay. Did you need a fingerprint page?” RP 116.

Tucker again stated, “So I don’t get no treatment, no help.” RP 116. The court responded, “Mr. Tucker, you know what, you’re 50-some years old, and it’s your life, and any time you want to stop using, you can stop using.” RP 116-17. The court continued, “But at some point, Mr. Tucker, you know what, you can take this off of me right now and you assume responsibility for your life.” RP 117. The court concluded, “At 50 years old . . . you’re not some spring chicken . . . Just sign the papers. I’m done.” RP 117. The 43-month sentence remained. CP 28-29.

Tucker filed a timely notice of appeal. CP 35.

C. ARGUMENT

1. THE TRIAL COURT ERRONEOUSLY DENIED TUCKER’S REQUEST FOR A DOSA ON THE IMPERMISSIBLE BASIS OF TUCKER’S AGE.

The purpose of a DOSA is to give eligible nonviolent drug offenders a reduced sentence, treatment, and increased supervision in an attempt to help them recover from addictions. RCW 9.94A.660; State v. Grayson, 154 Wn.2d 333, 337, 111 P.3d 1183 (2005). If a trial court determines an individual is eligible for a DOSA, it must still consider whether “the alternative sentence is appropriate.” RCW 9.94A.660(3); State v. Hender, 180 Wn. App. 895, 900, 324 P.3d 780 (2014).

The parties appeared to agree Tucker was eligible for a prison-based DOSA. CP 52; RP 110-12. This is consistent with the statutory eligibility requirements in RCW 9.94A.660(1). Tucker was convicted of a nonviolent offense. RCW 9.94A.030(55), .660(1)(a). He had not been convicted of a violent offense for more than 10 years. CP 25-26; RCW 9.94A.660(1)(c). And defense counsel represented to the court that Tucker had never previously received a DOSA. RP 111-12; RCW 9.94A.660(1)(g).

With a prison-based DOSA, individuals serve one-half the midpoint of the standard range in prison and receive substance abuse treatment while incarcerated. RCW 9.94A.662(1)(a), (2). They are then released into closely monitored community supervision for the same length of time. RCW 9.94A.662(1)(b); Grayson, 154 Wn.2d at 338. Individuals have significant incentive to comply with the conditions of a DOSA, because failure may result in serving the remainder of the sentence in prison. RCW 9.94A.660(7)(c), .662(3); Grayson, 154 Wn.2d at 338.

A DOSA is an alternative form of standard range sentence. State v. Murray, 128 Wn. App. 718, 726, 116 P.3d 1072 (2005). As such, a trial court's decision whether to grant a DOSA is discretionary and generally not reviewable. State v. Smith, 118 Wn. App. 288, 292, 75 P.3d 986 (2003). "Exceptions are if the trial court refused to exercise discretion at all or relied on an impermissible basis in making the decision." State v. Lemke, 7 Wn.

App. 2d 23, 27, 434 P.3d 551 (2018). A court relies on an impermissible basis if, for example, it takes the position “that no drug dealer” should get an alternative sentence, “or it refuses to consider the request because of the defendant’s race, sex or religion.” State v. Garcia-Martinez, 88 Wn. App. 322, 330, 944 P.2d 1104 (1997). In the same vein, “constitutional challenges to a standard range sentence are always allowed.” State v. Mail, 121 Wn.2d 707, 712, 854 P.2d 1042 (1993).

In Grayson, for instance, the trial court erred in categorically refusing to consider a DOSA based on its belief that there was inadequate funding to support the program. 154 Wn.2d at 342. The supreme court reversed, even though “there were ample other grounds to find that Grayson was not a good candidate for DOSA,” such as Grayson’s extensive drug-based criminal history. Id. at 342-43. In Lemke, the trial court’s denial of a DOSA was reversed on appeal where the court manifested personal animosity towards Lemke, calling him a “fucking addict” and “just a criminal.” 7 Wn. App. 2d at 27-28.

In State v. Smith, 118 Wn. App. 288, 282, 75 P.3d 986 (2003), by contrast, the court held Smith’s failure to successfully complete drug court (one form of community-based treatment) was a tenable basis to deny his request for a DOSA (another form of community-based treatment). Similarly, in Hender, 180 Wn. App. at 902, the trial court did not abuse its

discretion in denying a DOSA based on Hender's lack of accountability and refusal to accept responsibility for his conduct.

Here, the trial court did not expressly state its reasons for denying Tucker's request for a prison-based DOSA, ruling only, "Yeah. I'm not going to do the DOSA. I'm gong to do the low end, 43 months." RP 114. The record suggests, however, that the court refused the DOSA in part because of Tucker's prior community treatment opportunities. RP 115 (court emphasizing Tucker's file showed "there were at least three other treatment opportunities," but noting, "maybe I'm wrong about that"). Failure to complete prior drug treatment is a permissible basis to deny a DOSA request. Smith, 118 Wn. App. at 282.

However, the record suggests the trial court relied on an additional, impermissible basis to deny the DOSA—Tucker's age. After discussing Tucker's prior treatment opportunities, the court asked, "How old are you?" RP 116. Tucker explained he would be 50 years old on Christmas Day, just four days away. RP 116; CP 22. Tucker explained he was "begging for another chance at life because if I go to prison, it's going to turn me back around, I'm going with criminal. I experienced that so many times. I need help. And I'm asking you last because I need help." RP 116.

After a pause in the proceedings, the court told Tucker, "you know what, you're 50-some years old, and it's your life, and any time you want to

stop using, you can stop using.” RP 116-17. The court continued, “And that’s up to you. But at some point, Mr. Tucker, you know what, you can take this off me right now and you assume responsibility for your life.” RP 117. Tucker insisted he was responsible. RP 117. The court chastised him, “At 50 years old . . . you’re not some spring chicken.” RP 117. The court concluded, “Just sign the papers. I’m done.” RP 117.

Thus, the trial court repeatedly emphasized Tucker’s age in denying his request for a DOSA, suggesting the decision was, at least in part, motivated by age-based animus. This Court should hold Tucker’s age was an impermissible basis for the trial court to deny his DOSA.

Government discrimination against individuals based on their age does not implicate a heightened standard of review. Mass. Bd. of Ret. v. Murgia, 427 U.S. 307, 313, 96 S. Ct. 2562, 49 L. Ed. 2d 520 (1976); Campbell v. Dep’t of Soc. & Health Servs., 150 Wn.2d 881, 901, 83 P.3d 999 (2004). Age-based classifications are therefore subject to rational basis review. Murgia, 427 U.S. at 314; Campbell, 150 Wn.2d. at 901. To survive rational basis review, the challenged government action must be “rationally related to a legitimate state interest.” Amunrud v. Bd. of Appeals, 158 Wn.2d 208, 222, 143 P.3d 571 (2006). The rational basis test, however, “is not a toothless one.” Mathews v. DeCastro, 429 U.S. 181, 185, 97 S. Ct.

431, 50 L. Ed. 2d 389 (1976) (quoting Mathews v. Lucas, 427 U.S. 495, 510, 96 S. Ct. 2755, 49 L. Ed. 2d 651 (1976)).

Age discrimination in the context of a DOSA denial does not survive rational basis scrutiny. Age is an immutable characteristic. It is a protected class under the Washington Law Against Discrimination, chapter 49.60 RCW, for good reason. Age is entirely unlike lack of accountability or refusal to accept responsibility, as in Hender, which are choices individuals have control over. Individuals of all ages can find themselves in the throes of drug addiction. Older offenders may, in fact, be in particular need of drug treatment in a formal institutional setting, having been unable to break their addiction through other means. There is no support for the assumption that older individuals will not benefit from chemical dependency treatment. On the contrary, research suggests older adults have more favorable long-term outcomes following treatment than younger adults.<sup>1</sup>

Consistent with this, defense counsel noted at sentencing, “At his age, at 50 years old, [long-term sobriety is] becoming even more important with every passing year. As we get older, we become more vulnerable. And I believe he understands that.” RP 113. Defense counsel was right, in many

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<sup>1</sup> Derek Satre et al., Five-Year Alcohol and Drug Treatment Outcomes of Older Adults Versus Middle-Aged and Younger Adults in Managed Care Program, 99 ADDICTION 1286, 1293-94 (2004); see also id. at 1295 (“These results should provide strong impetus to health and social service providers to encourage older adults to seek chemical dependency treatment.”). For this Court’s ease of reference, the cited scholarly articles are attached to this brief as appendices.

ways. For one, research shows older adults have increased vulnerability to drug effects and drug interactions.<sup>2</sup> Older addicted adults may also be at increased risk of victimization.

The legislature did not limit the availability of drug treatment to younger offenders. RCW 9.94A.660(1). There is no reasonable or rational basis that drug treatment should not be available to middle-aged and older offenders, who may suffer just as much, if not more, from their addictions. The community, in turn, suffers from lack of treatment opportunities for older offenders. Whether a “spring chicken” or not, Tucker deserved to be evaluated for a DOSA not on the basis of his age, but rather his amenability to treatment, the circumstances of his offense, and other appropriate factors. RP 117. As one scholar aptly put it, substance abuse problems “have, indeed, no age limits.”<sup>3</sup>

The trial court improperly considered Tucker’s age, without a rational basis to do so, in denying his request for a DOSA. Though there

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<sup>2</sup> Alexis Kuerbis et al., Substance Abuse Among Older Adults, 30 CLINICAL GERIATRIC MED. 629 (2014); see also Birgit Koechl, Age-Related Aspects of Addiction, 58 GERONTOLOGY 540, 540 (2012) (emphasizing the “wide range of health risks, social exclusion and isolation” associated with drug and alcohol abuse in older individuals).

<sup>3</sup> Koechl, supra note 2, at 540. The same scholar noted, “It is estimated that the number of people aged 50 years and above in need of substance-related addiction treatment will increase by 300% in the USA from 1.7 million in 2000/2001 to 4.4 million in 2020.” Id. (citing Joseph Gfroerer et al., Substance Abuse Treatment Need Among Older Adults in 2020: The Impact of the Aging Baby-Boom Cohort, 69 DRUG & ALCOHOL DEPENDENCE 127 (2003)).

may have been other valid reasons to deny the DOSA, Grayson makes clear that reliance on an impermissible basis is cause for reversal. Grayson, 154 Wn.2d at 342-43. This Court should reverse Tucker’s sentence and remand for resentencing. Id. at 343.

2. DISCRETIONARY COSTS AND INTEREST ON NONRESTITUTION LFOs MUST BE STRICKEN FROM TUCKER’S JUDGMENT AND SENTENCE.

Tucker was homeless at the time of his arrest. RP 66-68. At sentencing on December 21, 2018, Tucker was just four days shy of his fiftieth birthday. CP 22. Tucker’s prior convictions show a long history of poverty- and drug-related offenses. CP 23-26. At sentencing, the trial court found Tucker indigent and waived all LFOs except the mandatory \$500 victim penalty assessment. RP 114; see also CP 26-27.

In State v. Ramirez, 191 Wn.2d 732, 738, 747, 426 P.3d 714 (2018), the supreme court discussed and applied Engrossed Second Substitute House Bill 1783, 65th Leg., Reg. Sess. (Wash. 2018) (HB 1783), which took effect on June 7, 2018 and applies prospectively to cases on direct appeal. HB 1783 amended RCW 10.01.160(3) to mandate: “The court shall not order a defendant to pay costs if the defendant at the time of sentencing is indigent

as defined in RCW 10.101.010(3)(a) through (c).”<sup>4</sup> Laws of 2018, ch. 269, § 6. The Ramirez court held this amendment “conclusively establishes that courts do not have discretion to impose such LFOs” on individuals “who are indigent at the time of sentencing.” 191 Wn.2d at 749.

a. Collection costs are discretionary and therefore prohibited.

The trial court imposed collection costs, ordering Tucker to “pay the costs of services to collect unpaid legal financial obligations per contract or statute,” citing RCW 36.18.190, RCW 9.94A.780, and RCW 19.16.500. CP 28. However, each of these statutes provide, at best, only discretionary authority to impose costs of unpaid LFO collection.

First, RCW 36.18.190 provides only discretionary authority for the court to impose collection costs: “The superior court may, at sentencing or at any time within ten years, assess as court costs the moneys paid for remuneration for services or charges paid to collection agencies or for collection services.” RCW 36.18.190 (emphasis added). “[T]he word ‘may’ has a permissive or discretionary meaning.” Staats v. Brown, 139 Wn.2d 757, 789, 991 P.2d 615 (2000).

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<sup>4</sup> Under RCW 10.101.010(3)(c), a person is “indigent” if he or she receives an annual income after taxes of 125 percent or less of the current federal poverty level.

Second, RCW 9.94A.780 provides only discretionary authority to DOC to assess a community corrections intake fee, and for DOC and the county clerk to assess associated collection costs. None of this authority is expressly granted to the court and all of the costs are discretionary.

RCW 9.94A.780(1) provides that an offender who is sentenced to community supervision “shall pay to the department of corrections the supervision intake fee,” “which shall be considered as payment or part of payment of the costs of establishing supervision to the offender.” However, the statute also provides DOC “may exempt or defer a person from the payment of all or any part of the intake fee based upon any of the following factors”: (a) inability to obtain sufficient employment income, (b) student status, (c) employment handicap, (d) age, (e) existence of dependents makes payment an “undue hardship,” or (f) “Other extenuating circumstances as determined by the department.” RCW 9.94A.780(1) (emphasis added).

Thus, subsection (1) addresses the authority of DOC to impose, waive, or defer community custody intake fees. The section does not grant any authority to the court to impose such fees at the time of sentencing. Even if it were interpreted to provide court authority, the fees are discretionary because the statute allows for them to be waived or deferred on the basis of factors affecting inability to pay. RCW 9.94A.780(1).

RCW 9.94A.780(7) further states that, if a county clerk assumes responsibility for community custody fees assessed by DOC, “the clerk may impose a monthly or annual assessment for the cost of collections.” (Emphasis added.) This subsection provides authority to the county clerk—not the trial court—to assess collection costs. Nothing in this section addresses authority of the court. And, regardless, the authority is discretionary because the statute uses the word “may.” RCW 9.94A.780(7).

The third statute cited by the trial court, RCW 19.16.500, provides general authority to government entities, including counties, to retain private collection agencies. RCW 19.16.500(1)(a). Under the statute, government entities “may add a reasonable fee” for collections. RCW 19.16.500(1)(b) (emphasis added). Again, this statute also provides only discretionary authority to impose collection costs.

The court’s general authority to impose costs, and the specific authority cited by the judgment and sentence, all provide, at best, only discretionary authority to impose collection costs. This Court should hold that costs of collection are discretionary and therefore prohibited by RCW 10.01.160(3), as well as the clear holding of Ramirez.

b. Nonrestitution interest is prohibited.

As discussed, HB 1783 modified Washington’s LFO system, addressing “some of the worst facets of the system that prevent offenders

from rebuilding their lives after conviction.” State v. Ramirez, 191 Wn.2d 732, 747, 426 P.3d 714 (2018). Among other changes, HB 1783 eliminated interest accrual on the nonrestitution portions of LFOs. Laws of 2018, ch. 269, § 1 (amending RCW 10.82.090); Ramirez, 191 Wn.2d at 747.

Thus, RCW 10.82.090 requires the sentencing court to impose interest on restitution.<sup>5</sup> RCW 10.82.090(1). But, following the changes made by HB 1783, the statute now provides that, “[a]s of June 7, 2018, no interest shall accrue on nonrestitution legal financial obligations.” RCW 10.82.090(1).

Despite this statutory change, Tucker’s judgment and sentence specifies: “INTEREST The financial obligations imposed in this judgment and sentence shall bear interest from the date of judgment until payment in full, at the rate applicable to civil judgments,” citing RCW 10.82.090. CP 28. As discussed, RCW 10.82.090(1) specifies that nonrestitution LFOs do not bear interest. But civil judgments bear an interest rate of 12 percent, which Tucker’s judgment and sentence currently mandates. RCW 4.56.110(2); CP 28. Thus, there is a conflict between the statute and the judgment.

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<sup>5</sup> No restitution was imposed at the time of sentencing and no restitution has yet to be ordered. CP 84.

“A judgment and sentence must be definite and certain.” State v. Mitchell, 114 Wn. App. 713, 714, 59 P.3d 717 (2002). Tucker’s judgment and sentence is not definite and certain as to whether interest applies to his nonrestitution LFOs. This Court should remand for the trial court to strike the interest provision, consistent with RCW 10.82.090(1).

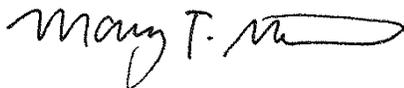
D. CONCLUSION

For the reasons discussed above, this Court should reverse Tucker’s sentence and remand for meaningful consideration of his DOSA request, without regard to his age. This Court should also remand for the trial court to strike collection costs and nonrestitution LFO interest from the judgment and sentence.

DATED this 29th day of May, 2019.

Respectfully submitted,

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# Appendix A

Derek Satre et al., Five-Year Alcohol and Drug Treatment Outcomes of Older Adults Versus Middle-Aged and Younger Adults in Managed Care Program, 99 ADDICTION 1286 (2004).

# Five-year alcohol and drug treatment outcomes of older adults versus middle-aged and younger adults in a managed care program

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## ABSTRACT

**Aims** This study compared 5-year treatment outcomes of older adults to those of middle-aged and younger adults in a large managed care chemical dependency program. We examined age group differences in individual, treatment and extra-treatment factors, which may influence long-term outcome.

**Design** Seventy-seven per cent of original study participants completed a telephone interview 5 years after out-patient chemical dependency treatment at Kaiser Permanente. This sample ( $N = 925$ ) included 65 patients aged 55–77, 296 patients aged 40–54 and 564 patients aged 18–39 (age at baseline).

**Measurements** Measures at follow-up included alcohol and drug use, Addiction Severity Index (ASI), Alcoholics Anonymous Affiliation Scale, social resource and self-reported health questions. Mortality data were obtained from contact with family members of patients as well as automated health plan records.

**Findings** Older adults were less likely to be drug-dependent at baseline than younger and middle-aged adults, and had longer retention in treatment than younger adults. At 5 years, older adults were less likely than younger adults to have close family or friends who encouraged alcohol or drug use. Fifty-two per cent of older adults reported total abstinence from alcohol and drugs in the previous 30 days versus 40% of younger adults. Older women had higher 30-day abstinence than older men or younger women. Among participants dependent only on alcohol, there were no significant age differences in 30-day abstinence. In logistic regression analysis, age group was not significant. Variables associated with greater age that independently predicted 30-day abstinence in the logistic regression model included longer retention in treatment and having no close family or friends who encouraged alcohol or drug use at 5 years; female gender was also significant.

**Conclusions** Results indicate that older adults have favorable long-term outcome following treatment relative to younger adults, but these differences may be accounted for by variables associated with age such as type of substance dependence, treatment retention, social networks and gender. Age differences in these characteristics inform intervention strategies to support long-term recovery of older adults and provide direction for investigation of how age affects outcome.

**KEYWORDS** Alcohol and drug treatment, Alcoholics Anonymous, long-term outcomes, managed care, older adults.

## INTRODUCTION

Consequences of alcohol and drug abuse and dependence among older adults include many significant physical and mental health problems (National Institute on Alcohol Abuse and Alcoholism 2000). An increase in the proportion of older adults in the US and European populations, along with substantial drug and alcohol use among cohorts approaching old age, is expected to increase the need for effective interventions for older individuals (Osterling & Berglund 1994; Beresford 1995; Gfroerer *et al.* 2003). However, there have been few outcome studies of older adults. It is not known how well older patients maintain abstinence over time, whether outcomes differ by gender or whether older adults have post-treatment support needs different from those of other patients. Such information could inform chemical dependency (CD) services for older patients. In addition, private and managed-care settings have received little attention, in spite of being significant providers of treatment for older adults (Edmunds *et al.* 1997).

In a previous paper, we investigated 6-month treatment outcomes for older adults (Satre *et al.* 2003). We found that patients aged 55 and over had a 30-day abstinence rate of 55%, versus 59% of those aged 40–54, and 50% of those aged 18–39. Other studies have also found that older adults have short-term outcomes equivalent to those of younger adults (Rice *et al.* 1993) or possibly better (Oslin, Pettinati & Volpicelli 2002). Long-term studies have generally found that older age is associated with better treatment outcome or remission from alcohol and drug problems (Vaillant 1996; Hser *et al.* 1997; Lemke & Moos 2003). We also found this effect when age was measured continuously in the present sample at 5 years, although older adults were not examined as a distinct group (Weisner *et al.* 2003). We expected to find higher abstinence rates among older adults in the age group analysis conducted in this study. However, we anticipated that the effect of age on abstinence would not be significant when individual, treatment and extra-treatment factors were controlled, because these factors would explain the effects of greater age on outcome.

This study examines ways in which older age may contribute to better treatment outcomes. We use a theoretical model that conceptualizes outcome as influenced by individual characteristics (e.g. demographic factors and substance use diagnosis), treatment characteristics (e.g. treatment intensity and length of stay) and extra-treatment factors (e.g. recovery-oriented and other social network factors) (Weisner *et al.* 2001b). For example, older adults generally have less illicit drug use, fewer psychiatric symptoms, longer stays in treatment and are more likely to be married than younger adults; these

factors are associated with better outcome (Blow *et al.* 1992; Moos, Mertens & Brennan 1993; Satre *et al.* 2003). Older women may have higher abstinence rates than older men, based on 6-month outcomes (Satre, Mertens & Weisner in press). To understand better long-term treatment outcome of older adults, we test a model that examines the effects of these factors on abstinence 5 years post-treatment.

This long-term follow-up study addresses significant gaps in the literature on alcohol and drug treatment of older adults. Community studies have included longitudinal analysis of substance use and heavy drinking in samples that include older adults (Wannamethee & Shaper 1988; Doll *et al.* 1994; Vaillant 1996; Kerr, Fillmore & Bostrom 2002). Long-term outcomes have been reported in a sample drawn from multiple US Veterans Administration treatment centers (Lemke & Moos 2003). However, to our knowledge, this is the first long-term study of older adults based on a private CD program, and the first to report long-term outcomes of older women. In addition, few studies have included outcome measures other than abstinence (Blow *et al.* 2000). We examine abstinence, heavy episodic drinking and addiction-related consequences. We also examine age differences in social networks and 12-Step utilization at 5 years, to inform support strategies for older CD patients.

## METHODS

### Participants

Study participants were men and women aged 18 and older admitted between April 1994 and April 1996 to treatment at the Kaiser Permanente Sacramento Chemical Dependency Recovery Program (CDRP). Northern California Kaiser Permanente (KP) is a large (3 million membership), group-model health maintenance organization (HMO). CD services in the health plan are provided internally, rather than through external contracts. Patients were referred to treatment through several sources, including medical providers, employers and employee assistance programs (EAPs), and self-referred. Compared to other patients, older adults were more likely to report that a physician suggested treatment, but less likely to report that an employer suggested treatment (Satre *et al.* 2003). This program was available to the general KP adult membership. Patients with dementia, mental retardation, or active psychosis were not eligible. There were no additional exclusion criteria for the study other than these program exclusion criteria. This program is similar to other abstinence-based, group-model private and public programs (Institute of Medicine 1990; Schmidt & Weisner 1993).

We recruited patients entering treatment. Of the 1312 patients contacted for the study, 1204 agreed to participate (92%). Sixty-two per cent of patients were randomized to two treatment conditions (63% of older adults, 60% of middle-aged adults and 63% of younger adults, with no significant differences). Non-randomized patients either chose not to be randomized (for reasons such as work-place requirements or time availability) or staff clinical judgement was made that an individual required a particular treatment condition (for further discussion of effects of randomization, see Weisner *et al.* 2000b). Patients who refused study participation still received treatment in the program.

We used an 'intent-to-treat' design, including all those recruited at intake, whether or not they agreed to be randomized or actually began treatment ( $N = 1204$ ). Of the 1204 individuals who completed an intake interview, 916 returned to initiate treatment (76%) with no significant differences by age group (Satre *et al.* 2003). Patient data were obtained from an interview conducted at intake and 5-year follow-up telephone interviews. Mortality rates were obtained from KP automated records or from family members at follow-up. Institutional review board approval was obtained from the Kaiser Research Foundation Institute and the University of California, San Francisco. Patients were included in the 5-year follow-up regardless of whether they remained in the health plan. All patients who completed the 5-year follow-up ( $N = 925$ ) were included in this analysis, representing 77% of the baseline sample of 1204 patients.

### Treatment programs

The original study assigned patients to either a day hospital or a traditional out-patient program. Treatment philosophy was based on total abstinence. In both programs, sessions included supportive group therapy, education, relapse prevention and family oriented therapy. Individual counseling, physician appointments and pharmacotherapy were available as needed. Patients were expected to attend regular 12-step meetings off-site. Patients received random breathalyzer and urine screens weekly during the first 4 weeks and monthly thereafter for 1 year (Weisner *et al.* 2000b).

The rehabilitation phase for both the day hospital and out-patient programs lasted 8 weeks. During the first 3 weeks, day hospital patients attended daily for 6 hours; in the out-patient program, patients attended a 1.5-hour session 3 days per week. During weeks 4–8, the programs had similar treatment intensity (four 1.5-hour sessions in day hospital and three 1.5-hour sessions in traditional out-patients). Aftercare began in the 9th week and consisted of one out-patient session per week for 10 months.

Patients were considered to have dropped out if they missed 7 continuous days during the first 8 weeks (i.e. the rehabilitation phase), or 30 continuous days after the first 8 weeks (i.e. during aftercare), based on attendance data from KP's automated registration database (Selby 1997). Treatment length was measured in weeks, and truncated at 52 weeks (1 year). Although the intended length of stay was the same, the mean length of stay was 10.5 weeks for patients in day hospital and 8.5 weeks for those in out-patient treatment. (For more information on the program and treatment retention, see Mertens & Weisner 2000; Weisner *et al.* 2000b.) There were no age differences in assignment to treatment condition. However, we control for the effects of treatment condition in this analysis.

### Measures

#### *Individual characteristics*

Demographic variables derived from the baseline interview included age group (18–39, 40–54 and 55 years and over), gender, ethnicity (white, African American, Hispanic, other), education, employment and income (less than \$40 000 per year or at least \$40 000 per year). To assess alcohol and drug dependence, we used questions from the Diagnostic Interview Schedule for Psychosocial Substance Dependence to provide a DSM-IV diagnosis for alcohol and drug (11 substance types) dependence (American Psychiatric Association 2000). For each substance, we established whether three of seven dependence symptoms were present during the previous 30 days (Weisner *et al.* 2000b, 2001a). We classified patients as alcohol-dependent, drug-dependent, both drug- and alcohol-dependent or as not dependent if they did not meet the criteria. Motivation was measured at intake by asking patients whether they identified abstinence as their treatment goal. The goal to abstain was related to positive outcomes at 6 months (Weisner *et al.* 2000b).

#### *Treatment*

Readmissions were identified using KP's automated administrative data systems and (for out-of-plan services among those who lost KP membership) responses from the 5-year interviews. 'Readmission' was defined as having at least three visits (with no more than 30 days' gap between each visit) to a CD program between 1 and 5 years after intake. Readmissions outside KP were captured via patient self-report. We do not intend readmission to represent a relapse; for example, readmissions can also measure visits of brief support to maintain abstinence (Weisner *et al.* 2003).

### Extra-treatment factors

These variables were obtained at 5-year follow-up. To measure social networks, we used questions developed to assess relationships conducive to and detracting from recovery (Kaskutas 1995). We asked each patient to estimate the number of people with whom he or she associates who: (1) is available to talk with the patient about personal problems (close friends), (2) is available to provide practical support (practical helpers), (3) actively supports the patient's efforts to reduce his or her drinking or drug use (recovery helpers) and (4) encourages the patients to use alcohol or drugs (recovery discouragers). Because responses to 'how many friends and family members do you have that encourage alcohol or drug use' were strongly skewed, with 85% of the sample responding '0', this measure was dichotomized. These social network variables have been predictive of abstinence outcome (Weisner *et al.* 2003), but psychometric properties have not been established.

To measure 12-Step participation, patients completed the Alcoholics Anonymous Affiliation Scale (Humphreys, Kaskutas & Weisner 1998). This nine-item scale is internally consistent across diverse demographic groups and health service settings and has a unifactorial structure. Seven items are scored dichotomously, and two items are scored in categories. The scale is scored continuously from 0 to 9. We adapted the measure to include participation in 12-Step groups other than Alcoholics Anonymous (AA) (e.g. Narcotics Anonymous, Marijuana Anonymous). We selected three of the highest factor-loading scale items to report separately to examine depth of 12-Step involvement: considering yourself a 12-Step member, ever having called a 12-Step member for help and number of 12-Step meetings attended during the last year (Humphreys *et al.* 1998). Number of 12-Step meetings attended was skewed towards zero, with 65% of the sample reporting no 12-Step attendance the prior year (with no difference by age group). To examine frequency of 12-Step attendance we eliminated these individuals from the analysis, resulting in a subsample of 319 (193 younger, 105 middle-aged and 21 older adults). As an indicator of availability of support from the treatment program, KP membership at 5 years was measured using a self-report question (yes/no).

### Outcomes

To assess addiction severity 5 years post-treatment, patients were administered an abbreviated form of the Addiction Severity Index (ASI). The abbreviated version comprises all questions that are included on the ASI composite scales, but omits some items that are not included. The ASI measures seven problem severity

areas: alcohol, drug, medical, employment, psychiatric, and family/social and legal problems. Information on frequency, severity and duration of these problems is obtained during the patient's life-time and during the prior 30 days. The composite score obtained in each area indicates problem severity in the 30 days prior to the interview (Weisner, McLellan & Hunkeler 2000a). The measure yields continuous scores from 0 (no problem) to 1.0 (extreme problem) for each domain (McLellan *et al.* 1992). Validity and reliability of the ASI has been found across patient age ranges (McLellan *et al.* 1985). However, we omitted the ASI employment scale from the analysis: because the majority of older adults are retired, scale items show disproportionate severity for older adults. As an alternative we use employment status (yes/no). The ASI was administered at baseline and 5 years.

The abstinence measure was total abstinence from drugs and alcohol over the preceding 30 days at the 5-year interview. All ASI items on past 30-day use had to be negative. Self-report measures of drug and alcohol use can be accurate (Midanik 1988; Chermack *et al.* 1998), and this has been found for older adults as well, based on comparison of self-report and collateral sources (Tucker *et al.* 1991). Patient self-reported abstinence in our sample at 6 months was validated with urinalysis and breathalyzer testing (Weisner *et al.* 2000b).

To measure stability of abstinence, we also asked patients to report longest period of abstinence in the previous 5 years and whether they were abstinent during the entire previous year. To assess heavy episodic drinking, we asked non-abstinent patients (those who reported drinking in the previous year) if they had had five or more drinks in one day in the prior year (yes/no), and how frequently they did so (four categories from once a month or less, to four or more times per week).

Patients' ASI medical scores at 5 years were used to measure health status. Patients were also asked 'in general, would you say your health is excellent, very good, good, fair or poor', and responses scored from 1 to 5. This measure is predictive of future health care utilization (Bierman *et al.* 1999) as well as morbidity (Weisen *et al.* 1999) and mortality (Idler & Benyamini 1997; Burstrom & Fredlund 2001). We also asked patients if they had smoked any cigarettes in the previous month. Because smoking is associated with numerous health problems, we included it as a proxy measure of health status. Smoking cessation was encouraged in the CD program, but was not included as a treatment component.

We used the ASI measure of whether patients had experienced a significant period of serious anxiety or depression in the previous month (two yes/no questions) not resulting from drug or alcohol use to measure mood status at follow-up.

## Procedures

All patients completed in-person baseline interviews at intake. One-hour interviews were conducted by research staff. Interviewers explained the treatment options, asked participants to accept random assignment, and obtained informed consent. Research staff conducted follow-up telephone interviews from the Division of Research, Oakland, 5 years after the 8-week rehabilitation phase of treatment on all individuals who completed baseline interviews.

## Data analyses

Participants were divided into three age groups: under 40, 40–54 and 55 and over at baseline. These categories are comparable to those used in previous studies (Lemke & Moos 2003; Satre *et al.* 2003). We examined mortality and follow-up participation rates by age, using  $\chi^2$  tests. We used baseline alcohol ASI scores to compare patients who were deceased to those not deceased at 5 years as an indicator of possible alcohol-related mortality, using the *t*-test. Age effects were examined using  $\chi^2$  tests of significance for categorical variables, with *post-hoc*  $\chi^2$  tests. Overall differences in 5-year abstinence by substance dependence diagnosis were examined; because most older patients were alcohol-dependent (80%) or did not meet dependence criteria (15%), we tested abstinence rates by age group in these two categories.

We used univariate analysis of variance (ANOVA) for continuous variables, with *post-hoc* Dunnett's tests to examine differences between discrete age groups. No adjustments were made for multiple comparisons (Rothman 1990). Analysis of patient outcome was conducted on all participants from the baseline sample who were followed, regardless of whether patient-started treatment or length of stay. The relationship of randomization status to 30-day abstinence was examined using  $\chi^2$  tests. ASI composite scores at 5 years were compared by age using ANOVA.

The effect of individual, treatment and extra-treatment factors on abstinence during the preceding month was examined using logistic regression. To determine variables to include in the analysis we tested the individual, treatment, and extra treatment factors that had significant age group differences ( $P < 0.05$ ), for their association with abstinence at 5 years, using ANOVA and  $\chi^2$  tests. Factors associated with older age group as well as abstinence were included in the regression model. Treatment condition (day hospital) was included as a dichotomous variable in the model, to control for possible effect of greater treatment intensity.

Due to the small number of women in the older age group ( $n = 17$ ), analyses by gender were limited to our

primary outcome measure (abstinence) using  $\chi^2$  tests. However, because the abstinence rate among older women was substantially higher than that of older men and younger women, we conducted *post-hoc* analyses to investigate why older women had the highest abstinence rates. To do so, we used  $\chi^2$  and *t*-tests to examine gender differences on key variables (those that were associated with abstinence) in the older adult group.

## RESULTS

### Participants in the 5-year follow-up

Of the baseline sample of 1204, 77% completed the 5-year follow-up interview ( $N = 925$ ). Individuals who did not respond to the 5-year interview were more likely to be male and to have low incomes at baseline, and were less likely to have begun treatment (Weisner *et al.* 2003). Before controlling for mortality, there were no significant differences in 5-year participation rate by age group (73% of older, 78% of middle-aged and 77% of younger adults who completed the baseline sample). However, these percentages were related differentially to mortality. Based on KP records, mortality rates at 5 years were 11% of older adults ( $n = 10$ ), 5% of middle-aged adults ( $n = 19$ ) and 1% of younger adults ( $n = 8$ ),  $\chi^2 (2, N = 1204) = 34.4, P < 0.001$ . In the sample as a whole, baseline ASI alcohol score was significantly higher among deceased patients (mean = 0.625, SD = 0.26) than those not deceased at 5 years (mean = 0.442, SD = 0.32),  $t = 3.4, P < 0.001$ . Among deceased patients there was no age difference in baseline alcohol score. When participation rates were calculated based on the sample still living at 5 years, 82% of older adults, 82% of middle-aged adults and 78% of younger adults were participants (not significant).

### Individual characteristics by age group

At baseline patients ranged in age from 18 to 77, with a mean age of 37.1 (SD = 10.8). In the older group, there were 39 patients aged 55–60, 17 patients aged 61–65, seven patients aged 66–70 and two patients aged 71–77. Table 1 shows results of age group comparisons in demographic characteristics and dependence diagnosis. Older adults were more likely to be diagnosed with alcohol dependence than either middle-aged adults or younger adults, and less likely to be diagnosed with drug dependence or combined drug and alcohol dependence ( $P < 0.01$ ).

### Treatment

Significant overall age differences were found for length of stay in treatment (Table 1). Older adults stayed in treat-

**Table 1** Baseline demographic characteristics, substance diagnoses and treatment measures by age group.

	Age group at baseline (years)			F or $\chi^2$
	18–39 (n = 564)	40–54 (n = 296)	55 + (n = 65)	
Age at baseline (mean and SD)	30.4 (6.3)	45.1 (3.8)	61.6 (6.0)	
Gender (%)				7.2**
Male	61	69	74	
Female	39	31	26	
Ethnicity (%)				21.7**
White	74	73	92 <sup>ab</sup>	
Black	11	16	2	
Hispanic	10	9	3	
Other	5	2	3	
Education (%)				57.8***
Some college	17	40	35	
High school	65	53	52	
<High school	17	8	13	
Employed	56	65	33 <sup>ab</sup>	22.8***
Income (% earning > 40 K)	40	56	48	20.2***
Abstinence goal (%)	70	80	78	9.0*
Dependence diagnosis (%)				
Alcohol only	29	60	80 <sup>ab</sup>	117.4***
Drug only	40	14	3 <sup>ab</sup>	87.6***
Alcohol and drug	22	13	2 <sup>ab</sup>	22.2***
Criteria not met	10	14	15	NS
Length of stay (weeks)	6.2 (11.5)	11.4 (16.7)	12.4 (18.4)	16.8***
Readmitted (%)	39	43	31	NS

n = 912–925. Significance of overall group differences was tested using chi-square and ANOVA. Results of post-hoc age group comparisons: <sup>a</sup>significantly different from younger; <sup>b</sup>significantly different from middle-aged ( $P < 0.01$ ). \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$ .

ment longer than the younger adult group,  $P = 0.03$ . There were no differences in the percentage of patients readmitted between the initial treatment episode and 5-year follow-up.

#### Extra-treatment factors

Table 2 shows the results of age group comparisons of social networks, marital status and recovery support. Older adults reported fewer close friends than either younger adults,  $P < 0.001$  or middle-aged adults,  $P = 0.001$ . Older adults were less likely than younger adults to report having family or friends who encouraged use (8% versus 17%),  $P = 0.04$ . Age group differences were found in marital status, with older adults more likely to be married than younger adults,  $P = 0.002$ .

Measures of 12-Step affiliation are reported in Table 2. There was no age effect on the AA Affiliation Scale score. However, older adults were less likely than middle-aged adults to have ever considered themselves a member of a 12-Step group,  $P = 0.015$ . Only 19% of older adults reported ever having called a 12-Step member for help in recovery versus 42% of middle-aged adults,  $P < 0.001$

and 47% of younger adults,  $P < 0.001$ . Age differences were found in KP membership at 5 years (91% of older adults, 80% of middle-aged adults and 59% of younger adults),  $P < 0.001$ .

#### Outcomes

Table 3 shows 5-year outcomes of the sample by age. Older adults were more likely than younger adults to report abstinence from alcohol and drugs during the preceding month,  $P = 0.04$ . Older adults were also more likely than younger adults to report abstinence during the preceding year,  $P = 0.02$ . Among those who reported drinking in the previous year ( $N = 559$ ), 62% reported heavy episodic drinking (five or more drinks in one day), with no age difference in occurrence (yes/no) or frequency.

Baseline diagnostic groups had differing rates of 30-day abstinence (total abstinence from alcohol and drugs) at 5 years; 50% of alcohol-dependent only, 40% of drug-dependent, 37% of alcohol- and drug-dependent and 40% those who did not meet dependence criteria,  $\chi^2 (3, N = 917) = 11.08, P = 0.011$ . Among patients with base-

**Table 2** Extra-treatment support factors at 5 years, by age group ( $n = 925$ ).

	Age group at baseline (years)			F or $\chi^2$
	18–39 ( $n = 564$ )	40–54 ( $n = 296$ )	55 + ( $n = 65$ )	
Number of close friends	5.2 (5.5)	5.1 (7.1)	3.0 (3.3) <sup>ab</sup>	4.1*
Number of practical helpers	6.9 (6.8)	7.2 (8.7)	6.8 (10.8)	NS
Number of recovery helpers	8.2 (11.0)	8.6 (12.7)	5.4 (7.5)	NS
Anyone encourage you to drink/use (%)	17	12	8	7.2*
Married or living as married (%)	39	54	59 <sup>a</sup>	24.5***
AA Affiliation Scale	2.9 (2.7)	3.1 (2.7)	2.3 (2.5)	NS
Ever been a 12-Step member (%)	58	66	50	7.8*
Ever called 12-Step for help (%)	47	42	19 <sup>ab</sup>	19.1***
Number of 12-Step meetings attended in past year	88.8 (96.0)	93.2 (99.1)	60.6 (77.4)	NS
Current Kaiser insurance (%)	59	80	91 <sup>a</sup>	55.6***

Analysis of number of 12-Step meetings includes only participants who reported attending one or more meetings in the previous year ( $n = 319$ ). Results of post-hoc age group comparisons: <sup>a</sup>significantly different from younger group, <sup>b</sup>significantly different from middle-aged group ( $P < 0.01$ ). \* $P < 0.05$ , \*\*\* $P < 0.001$ .

**Table 3** Five-year outcomes by age group ( $n = 925$ ).

	Age group at baseline (years)			$\chi^2$ or F
	18–39 ( $n = 564$ )	40–54 ( $n = 296$ )	55 + ( $n = 65$ )	
Longest period of total abstinence, in days	486 (476)	562 (502)	699 (647)	5.0**
Total abstinence in previous year (%)	29	42	42	16.8***
Total abstinence in previous 30 days (%)	40	49	52	8.8*
Men (%)	37	45	43	NS
Women (%)	44	57	81 <sup>a</sup>	10.7**
Addiction Severity Index				
Alcohol	0.087 (0.14)	0.086 (0.16)	0.084 (0.14)	NS
Drug	0.018 (0.04)	0.008 (0.02)	0.008 (0.02)	NS
Medical	0.177 (0.31)	0.222 (0.34)	0.222 (0.34)	NS
Legal	0.016 (0.08)	0.001 (0.01)	0.000 (0.00) <sup>a</sup>	6.4**
Family/social	0.118 (0.19)	0.064 (0.14)	0.046 (0.11) <sup>a</sup>	12.7***
Psychiatric	0.173 (0.21)	0.162 (0.02)	0.145 (0.18)	NS
Self-reported health	2.52 (0.96)	2.78 (1.04)	2.97 (1.03) <sup>a</sup>	10.6***
Smoked cigarettes in past 30 days (%)	56	44	37 <sup>a</sup>	16.7***
Serious anxiety in past 30 days (%)	38	31	28	NS
Serious depression in past 30 days (%)	25	25	23	NS

$n = 913$ – $925$ . Self-reported health was measured on a scale from 1 (excellent) to 5 (poor). ASI age group differences were tested using ANOVA. Results of post-hoc age group comparisons: <sup>a</sup>significantly different from younger group, <sup>b</sup>significantly different from middle-aged group ( $P < 0.01$ ). \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

line diagnosis of alcohol dependence only ( $N = 382$ ), 52% of older and middle-aged adults and 47% of younger adults were abstinent (not significant). Among patients who did not meet dependence criteria ( $N = 107$ ), 60% of older adults, 49% of middle-aged adults and 30% of younger adults were abstinent (not significant).

Table 3 shows age comparisons for ASI composite scores at 5 years. Significant age effects were found for legal and family/social scales. Older adults reported worse health and were less likely to report smoking cigarettes in the previous 30 days than younger adults

( $P < 0.01$ ). Because our sample included both randomized and non-randomized participants, we examined differences between these two groups at 5 years. Forty-four per cent of randomized and 43% of non-randomized patients were abstinent (not significant).

#### Variables associated independently with abstinence

To test our model, we examined effects of individual, treatment and extra-treatment characteristics on 30-day abstinence at 5 years, using logistic regression analysis

(Table 4). Variables selected were components of our model that had significant age bivariate differences and were associated with abstinence at 5 years. These variables were significantly associated with abstinence at 5 years, using  $\chi^2$  or one-way ANOVA analyses (not shown): female gender ( $P = 0.003$ ), baseline dependence diagnosis ( $P = 0.011$ ), longer treatment retention ( $P < 0.001$ ); and being married ( $P = 0.010$ ), health plan membership ( $P = 0.01$ ) and not having any friends or family who encouraged alcohol or drug use at 5 years ( $P < 0.001$ ). These variables, age group and gender were entered into a single model. Age group was not significant. Significant variables were female gender, greater treatment retention and having no close family or friends who encouraged alcohol or drug use at 5 years. For the overall model,  $\chi^2 (11, N = 914) = 88.14, P < 0.001$ , Cox & Snell pseudo- $R^2 = 0.09, P < 0.001$ .

#### Analysis of gender differences

Older women were more likely to be abstinent than older men,  $\chi^2 (1, N = 65) = 7.2, P = 0.007$ . Within gender, there were differences in effect of age group on 30-day abstinence. Older women were also more likely to be abstinent than younger women,  $\chi^2 (1, N = 233) = 8.2, P = 0.004$ ; but when only men were analyzed, there was no age effect (Table 3). Because of this striking gender difference, we conducted *post-hoc* analyses of older adults by gender to test potential explanations using  $\chi^2$  and *t*-tests. We caution that the small number of older women ( $n = 17$ ) resulted in limited power. Older women stayed in treatment for 20.7 weeks ( $SD = 22.8$ ) versus 9.5 weeks ( $SD = 15.8$ ) for older men,  $t = 2.2 (65)$ ,

$P = 0.03$ . Mortality rates were 5% for older women and 13% for older men (not significant). Among older adults there were no gender differences in baseline substance diagnosis, AA Affiliation scale score, marital status, number of close friends, self-reported health, Kaiser membership at 5 years, or in whether or not they had a close friend or family member that encouraged drug use at 5 years.

#### DISCUSSION

This study examined 5-year outcomes of older, middle-aged and younger adults in a private, non-profit managed care program that has integrated medical and behavioral health treatment. Abstinence rates of older adults were higher than those of younger adults, although age differences were not found among participants dependent only on alcohol. These results are generally consistent with previous studies that have found that older adults in mixed-aged treatment settings have short-term outcomes as good or better than those of younger adults (Oslin *et al.* 2002; Satre *et al.* 2003). Mortality findings, which showed increased mortality with age, have also been found in public samples (Moos, Brennan & Mertens 1994; Lemke & Moos 2003). Mortality rates in our sample were lower than those found in these studies, across all three age groups, possibly because health plan records used to determine mortality in our study excluded those patients who had left the health plan and could not be located at the 5-year follow-up and because this is an insured population which perhaps has had more access to health care.

**Table 4** Summary of logistic regression analysis for variables associated with 30-day abstinence from alcohol and drugs, 5 years following treatment ( $n = 914$ ).

Variable	OR	95% CI
Individual characteristics		
Age group (older versus younger)	1.18	(0.65, 2.14)
Age group (middle versus younger)	1.11	(0.80, 1.50)
Gender (female versus male)**	1.51	(1.13, 2.02)
Alcohol dependence (versus alcohol and drug dependence)	1.43	(0.95, 2.17)
Drug dependence (versus alcohol and drug dependence)	1.13	(0.74, 1.73)
Dependence criteria not met (versus alcohol and drug dependence)	0.87	(0.51, 1.49)
Treatment		
Length of stay (weeks)***	1.03	(1.02, 1.04)
Greater treatment intensity	1.15	(0.87, 1.52)
Extra-treatment factors		
Health plan membership	1.16	(0.85, 1.57)
Married	1.17	(0.88, 1.55)
No friends or family that encourage drinking or drug use***	3.01	(1.97, 4.67)

All extra-treatment factors were measured at 5-year follow-up. 'Health plan membership' indicates Kaiser membership. The logistic regression analysis eliminates cases with missing data on any predictor. For the overall model,  $\chi^2 (11, N = 914) = 88.14, P < 0.001$ , Cox & Snell pseudo- $R^2 = 0.09, P < 0.001$ . \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

We tested a model that included individual, treatment and extra-treatment characteristics of older adults to examine how age affects abstinence, and to inform strategies to support long-term recovery among older adults. Age was not a significant predictor of abstinence once substance diagnosis, gender, treatment retention and social networks were considered. Staying longer in treatment and not having friends who encourage alcohol or drug use were the most important of these factors.

Previous studies have found that longer treatment duration leads to better outcome (Gotthel, McLellan & Druley 1992) and that older adults often remain longer in treatment (Schuckit 1977; Wiens *et al.* 1982). We also found that older adults had longer treatment retention than younger adults (Satre *et al.* 2003). Although the odds ratio is very small, the finding that length of stay is associated independently with abstinence at 5 years suggests that persistence in treatment has long-lasting benefits.

It is important that older adults have adequate support following treatment. Particularly in older subgroups, social networks may be reduced as a result of physical limitations and loss of family members and friends. However, in our relatively young sample of older adults, patients reported fewer family problems and were more likely to be married than the younger adult group. Higher rates of continued health plan coverage and lower scores on the family/social ASI scale may be indicative of better social stability. Most significantly, less likelihood of having any family members or friends who encourage alcohol or drug use is an advantage of older adults in the sample.

Age findings on 12-Step affiliation measures were mixed. On items that appear to signify greater depth of involvement, older adults scored lower. In contrast, a study of male veterans found that older adults were equally involved as younger and middle-aged adults in 12-Step groups 2 years following in-patient treatment (Lemke & Moos 2003). Less reliance on 12-Step groups among older adults, if replicated, is associated potentially with practical barriers to meeting attendance, developmental changes in social interaction with age or greater reliance on a marital partner. The oldest of the older adult group may lack transportation, have physical disabilities or feel uncomfortable attending meetings in the evening. This group also tends to have smaller social networks than younger adults, yet report comparable satisfaction from network size and quality (Lansford, Sherman & Antonucci 1998). They may be less interested than younger adults in expanding networks (Carstensen, Gross & Fung 1998). However, 12-Step groups are potentially less useful for individuals uncomfortable sharing personal information in large or anonymous groups

(Galaif & Sussman 1995). It is possible that older adults may benefit from smaller groups, or groups that focus on older adult issues. Alternatively, older adults may benefit from mobilizing existing social networks to support recovery.

We identified variables likely to contribute to the effect of gender on outcome, such as greater treatment retention among older women than older men. Previous analysis of the entire sample found that women attended more 12-Step meetings prior to 5-year follow-up, and were more likely to have family or friends supporting their efforts to reduce substance use (Weisner *et al.* 2003). Therefore, the older women in this sample may have several characteristics contributing to abstinence, associated with being both older and female.

### Limitations of the study

On some measures, differences between older and middle-aged adults were not significant, despite apparent linear trends in the data (e.g. marital status, current Kaiser Permanente insurance, 12-Step affiliation, self-reported health). Significance testing may have been limited by the small sample size of the older group relative to the other age groups. Therefore, our results may underestimate some differences between older and middle-aged adults. While we did not adjust significance level for multiple comparisons in the study (Rothman 1990), we note that use of multiple comparisons increases the odds of Type I error (false positive results) in the analyses.

Mortality in the sample was associated with greater baseline alcohol problem scores, suggesting that alcohol problems may have contributed to cause of death. As a result, it is possible that age group differences in mortality may have influenced the higher abstinence outcome rate observed among older adults compared with younger adults.

An additional issue is inclusion of both randomized and non-randomized patients in our study. Because our intent was to be representative of the population entering treatment, we also recruited those unable or unwilling to be randomized for all study procedures. Those not randomized were assigned to treatment condition by usual practice. In the original 6-month outcome study, we found that among non-randomized patients, better outcomes resulted in the day hospital versus out-patient treatment condition (Weisner *et al.* 2000b), although these differences were no longer found at the 5-year follow-up. Importantly, randomization status did not differ by age group. However, inclusion of both randomized and non-randomized patients in each treatment condition may result in variability in patient motivation, employer pressure and other factors within treatment conditions (Weisner *et al.* 2000b). Therefore, we examined the

relationship of randomization status to outcome at 5 years, and found no relationship.

Long-term drug and alcohol treatment outcome of older adults has been under-investigated, in spite of prominent arguments for its importance (Institute of Medicine 1990; Blow *et al.* 2000). The under-representation of older adults in typical treatment programs has contributed to the difficulty of developing a body of research to address this gap in the literature (Booth *et al.* 1992). Therefore, the current study makes an important addition to understanding treatment in this population.

While the focus of this study is on older adults, it should be noted that the percentage of older adults in the sample is small (7%) and that the older sample includes those as young as age 55. Therefore, results may not generalize to older subgroups within the elderly population (such as adults in their 70s and older) who may differ in areas such as health status and the proportion retired. In future studies, it will be important to utilize larger samples in which the differences between older and younger subgroups could be examined.

The study examined understudied populations, including privately insured individuals, older adults and women in a large treatment sample with a high long-term follow-up rate. Although individuals in privately insured samples, such as this one, may have lower levels of problem severity than those in public samples, it is important to examine this population since private programs represent the predominant mode of US chemical dependency treatment.

The gender composition of the sample represents an improvement over previous treatment studies of older adults, which with few exceptions have been based on all-male samples (Rice *et al.* 1993; Blow *et al.* 2000). The small number of older women in our sample made extensive gender comparisons unfeasible; differences that were found should be generalized with caution, yet the large gender difference in abstinence within the older adult group is intriguing. Length of stay appears to play a role in better outcomes among older women. Further study is clearly needed to examine treatment of older women in order to understand factors contributing to recovery. Analysis of larger samples would also be useful to investigate whether better outcome with age occurs only in women, or if this finding applies to men as well.

## CONCLUSIONS

This study examined long-term treatment outcome of older adults compared with middle-aged and younger adults in a managed care chemical dependency program. Good outcome of older adults 5 years after treatment, especially among older women, is a welcome finding.

These results should provide strong impetus to health and social service providers to encourage older adults to seek chemical dependency treatment. Results also support development of more effective ways to engage older patients who may be reluctant to seek treatment. Our results identify factors contributing to abstinence 5 years after receiving treatment, including domains in which older adults may require assistance. In particular, future studies should investigate potential sources of extra-treatment support such as social networks and 12-Step groups, to maximize treatment success in this growing population.

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# Appendix B

Alexis Kuerbis et al., Substance Abuse Among Older Adults, 30  
CLINICAL GERIATRIC MED. 629 (2014).

# Substance Abuse Among Older Adults



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## KEYWORDS

- Older adults • Alcohol • Prescription medication • Substance use • Assessment
- Assessment tools • Brief interventions • Treatment

## KEY POINTS

- Although the current proportions of older adults with substance use disorders remain low compared with the general population, a growing proportion and number of older adults are at risk for hazardous drinking, prescription drug misuse, and illicit substance use and abuse.
- The identification of problematic substance use with older adults can be difficult because of overlapping symptoms with medical disorders that are common in older age.
- The assessment should include a respectful and nonstigmatizing approach along with direct questions about drinking, prescription medication, and illicit drug use.
- Several brief interventions centered on education about the harms of substance use have been shown to be effective with older adults.
- For older adults with more severe substance use problems, more intensive treatments geared toward a general population have been shown to be effective for older adults; however, treatments tailored for older adults have shown particular promise.

## INTRODUCTION

The initial wave of the baby boom generation turned 65 years old in 2011, a generation that comprises 30% of the total US population.<sup>1</sup> The size of this generation and their longer life expectancies<sup>2</sup> led the US Census Bureau to project that the number of older adults will increase from 40.3 million to 72.1 million between 2010 and 2030.<sup>3</sup> Historically, older adults have not demonstrated high rates of alcohol or other drug use

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than 6% used tobacco and alcohol together in the last 12 months. Clinical trials examining smoking cessation interventions demonstrate that older-adult smokers tend to be long-term, heavy smokers who are also physiologically dependent on nicotine.<sup>27–29</sup>

### ***Illicit Substance Use***

Illicit drug use is more prevalent among American older adults than among older adults in almost any other country in the world.<sup>30</sup> Results from the 2012 National Survey on Drug Use and Health revealed that rates of past month use of illicit substances doubled on average (from 1.9%–3.4% to 3.6%–7.2%) among 50 to 65 year olds between 2002 and 2012<sup>5</sup>—a statistically significant increase driven by the baby boom generation.<sup>5,11</sup> Generally, individuals aged 50 to 64 years report more psychoactive drug use than older groups.<sup>24,31,32</sup> For example, in 2012, 19.3% of adults aged 65 years and older reported having ever used illicit drugs in their lifetime, whereas 47.6% of adults between 60 and 64 years of age reported lifetime drug use. Among those that do use illicit substances, 11.7% meet the criteria for past-year SUD.<sup>31</sup> There are no recommendations for safe levels of illicit drug use among older adults.<sup>33</sup>

Cannabis use by older adults is considerably more prevalent than other drugs. Among adults aged 50 years and older in 2012, 4.6 million reported past-year marijuana use, and less than one million reported cocaine, inhalants, hallucinogens, methamphetamine, and/or heroin use in the past year. These rates are consistent with those reported by other studies.<sup>24,31</sup> With the passage of medical marijuana legislation and relaxed enforcement of drug possession related to marijuana, the prevalence rate of use among older adults may increase as they use it to cope with illness-related side effects,<sup>20</sup> potentially facilitating an increase in recreational use.

### ***Prescription, Nonprescription, and Over-the-Counter Medication Use***

Older adults take more prescribed and over-the-counter medications than younger adults,<sup>22,34</sup> increasing the risk for harmful drug interactions, misuse, and abuse. A cross-sectional community-based study of 3005 individuals aged 57 to 85 years found that 37.1% of men and 36.0% of women used at least 5 prescription medications concurrently.<sup>35</sup> The study also found that about 1 in 25 of the participants were at risk for a major drug interaction, and half of these situations involved nonprescription medications. In 2012, 2.9 million adults aged 50 years and older reported nonmedical use of psychotherapeutic medications in the past year.<sup>5</sup> Estimates of prescription medication misuse among older women are 11%.<sup>36</sup> Blazer and Wu<sup>32</sup> reported that 1.4% of adults aged 50 years and older used prescription opioids nonmedically in the last year, which was higher than sedatives, tranquilizers, and stimulants (all <1%). Actual prescription opioid use disorder among this same group was 0.13%, yet dependence was more common than abuse.<sup>31</sup> Benzodiazepines are the most commonly prescribed psychiatric medication among all adults. Despite contraindications for use with older adults, they are widely prescribed<sup>37</sup> and are disproportionately prescribed to older adults.<sup>38</sup> Rates of benzodiazepine use among older adults have ranged from 15.2% to 32.0%.<sup>39</sup> It is important to note that the rates of benzodiazepine use may be impacted by overprescription, misdiagnosis, or polypharmacy rather than intentional misuse or abuse.

## **UNIQUE VULNERABILITIES FOR OLDER ADULTS USING MOOD-ALTERING SUBSTANCES**

Although the rates of SUD and use of drugs and alcohol are generally lower among older adults than the general population, aging itself presents specific risks for harm

when considering even minimal amounts of substance use among older adults. Risk factors may vary considerably by substance and the specific clinical presentation of a patient (eg, age, medical comorbidities, current medications, and health history). Understanding substance-specific risks can help practitioners to recognize and respond to unhealthy use that does not meet the narrow definition of problem use.

### **Alcohol**

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Alcohol has a unique physical impact on the body in late life as compared with adults in young to middle age.<sup>40</sup> As one ages, the percentages of lean body mass and total body water decrease, and the ability of the liver to process alcohol is also diminished; blood-brain barrier permeability and neuronal receptor sensitivity to alcohol in the brain increase.<sup>22</sup> Because of these changes, older adults experience higher blood alcohol concentrations and increased impairment compared with younger adults<sup>40</sup> at equivalent consumption levels and with less awareness of their impairment,<sup>41–43</sup> thus, rendering them more vulnerable to the ill effects of alcohol even in moderate amounts. Compared with moderate drinkers, older-adult at-risk drinkers are more likely to experience alcohol-related problems<sup>14,25</sup> and basic functional impairment, such as impaired instrumental activities of daily living (eg, shopping, cooking, responsibility for medication).<sup>25</sup> The increased rate of comorbid medical and psychiatric conditions and the medications used to treat them create a complicated picture of risk and unique vulnerabilities for older adults.<sup>10</sup> Even healthy drinking levels established in young to middle age and then sustained through older age may be a risk factor for health problems among older adults.<sup>44</sup>

Despite the older person's increased vulnerability to alcohol, moderate alcohol consumption is associated with decreased morbidity and mortality among older adults.<sup>45,46</sup> A large body of research suggests that those older adults who are moderate drinkers (no more than one standard drink per day) experience better health than their heavier drinking and abstinent peers.<sup>47–49</sup> For example, moderate-drinking older adults have been discovered to have fewer falls, greater mobility, and improved physical functioning when compared with nondrinkers.<sup>40</sup>

It is important to note that many of the health benefits of moderate alcohol use for older adults may come with negative trade-offs. For example, moderate drinking may decrease the risk of ischemic stroke but increase the risk of hemorrhagic stroke<sup>50</sup> and have many potential interactions with medications.<sup>51</sup> As with other age groups, it would seem that the benefits of alcohol for older adults varies across individuals and depends on each person's unique biopsychosocial context, including age, comorbid illnesses, sex, and genetics.

### **Medications and Illicit Drugs**

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The same biologic changes that increase the effect of alcohol among older adults also increase the effect of medications and illicit drugs, causing an increased vulnerability to drug effects and drug interactions.<sup>22</sup> For example, older adults process benzodiazepines and opiates differently than younger adults; these medications should be prescribed with caution. Benzodiazepines with long half-lives are contraindicated for older adults as they can cause excessive sedation.<sup>36</sup> Benzodiazepines are fat-soluble drugs; as adults have less lean muscle mass and more body fat as they age, these drugs have a longer duration of action. Other risks associated with medication use in older adults occur because they may see multiple doctors, each of who may prescribe them medications that may interact with each other and/or with alcohol or other substances. Alcohol and marijuana increase the sedative effects of drugs such as barbiturates, benzodiazepines, and opiates.<sup>52</sup> Older adults may also

unintentionally misuse a medication by borrowing a prescribed medication from another person (eg, taking a dose of another person's lorazepam or zolpidem for sleep), taking more than intended, or confusing pills.

The increasing acceptance of marijuana use, both medicinally and recreationally, may also pose unique risks in an aging population. Marijuana is known to cause impairment of short-term memory; increased heart rate, respiratory rate, elevated blood pressure; and a 4-time increase in the risk for heart attack after the first hour of smoking marijuana.<sup>53</sup> These risks may be pronounced in older adults whose cognitive or cardiovascular systems may already be compromised. Additionally, tobacco use among older adults is associated with greater mortality, risks of coronary events and cardiac deaths, smoking-related cancers, chronic obstructive pulmonary disease, decline in pulmonary function, development of osteoporosis, risk of hip fractures, loss of mobility, and poorer physical functioning.<sup>54,55</sup> Incidentally, smoking also impairs or inhibits effective treatments for these conditions.<sup>56</sup> It is unclear which of these correlates to smoking tobacco also appear for marijuana.<sup>53</sup>

### RISK FACTORS FOR OLDER ADULTS USING SUBSTANCES

Most research on the correlates and predictors of substance use in late life has been conducted on alcohol use. Individual, social, and familial factors that contribute to or are associated with late-life unhealthy drinking may also apply to other substances. **Box 1** lists some of the potential risk factors for older adults associated with use of alcohol and, where known, other substances.

<b>Box 1</b>
<b>Risk factors related to substance use in late life</b>
Physical risk factors
Male sex (for alcohol), female sex (for prescription drug)
Caucasian ethnicity
Chronic pain
Physical disabilities or reduced mobility
Transitions in care/living situations
Poor health status
Chronic physical illness/polymorbidity
Significant drug burden/polypharmacy
Psychiatric risk factors
Avoidance coping style
History of alcohol problems
Previous and/or concurrent SUD
Previous and/or concurrent psychiatric illness
Social risk factors
Affluence
Bereavement
Unexpected or forced retirement
Social isolation (living alone or with nonspousal others)

### **Demographics**

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Being male,<sup>23</sup> more affluent,<sup>20,57,58</sup> Caucasian,<sup>23,59</sup> and young-old (those in the early stages of late life)<sup>23</sup> are consistently associated with unhealthy drinking in late life. Among all the demographics that are associated with increased drinking, only one is a predictor of increased drinking in older age: having more financial resources or longer financial horizons.<sup>57,58</sup> Female sex is associated with prescription drug abuse.<sup>36</sup>

### **Physical and Mental Health**

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Both current alcohol use and unhealthy drinking in older age are associated with being in better overall health<sup>23,57</sup>; however, this does not imply a causal relationship but rather suggests that those in good health are apt to drink more than their counterparts in poor health. Indeed, drinking has been shown to decrease as hospitalizations, disabilities, or depression increase.<sup>23,60,61</sup> Importantly, across studies, older heavy drinkers demonstrate poorer physical and mental health<sup>23,40,61,62</sup> as compared with their low-risk drinking counterparts. Drinking to reduce pain is a crucial long-term predictor of alcohol use in older adulthood.<sup>58</sup>

Because comorbid psychiatric disorders, such as anxiety, depression, and personality disorders, are common and recognized among younger adults, it is assumed that these comorbidities also continue into late life. Although there is little research about psychiatric comorbidity with substance use among older adults, some evidence suggests there is a high correlation between substance use, specifically alcohol use, and depression<sup>63,64</sup> and other affective disorders<sup>33,65</sup> among older adults.<sup>66,67</sup> The co-occurrence of depression and AUD can greatly complicate the diagnosis and treatment of both. For example, older adults may be more likely to disclose depressive symptoms and present to primary care settings rather than mental health or substance abuse treatment settings.

Sleep disturbance and sleep disorders are common among older adults who use alcohol<sup>68</sup> and who may use alcohol as a sleep aid.<sup>33</sup> Concurrent use of alcohol and medications for insomnia is risky because of drug interaction effects that cause excessive sedation and cross-tolerance. The factors associated with prescription medication abuse in older adults include a history of a SUD or mental health disorder and medical exposure to prescription drugs with abuse potential.<sup>36</sup> There is also evidence to suggest that overall cognitive impairment and several different types of dementia are more prevalent among older adults with comorbid alcohol use disorders<sup>22,25,69,70</sup> and that the differential diagnosis between Alzheimer disease and alcohol-related dementia is difficult.<sup>33</sup>

Among comorbid SUD, alcohol and tobacco are used commonly together among older adults<sup>10</sup>; being a smoker increases the likelihood of being an at-risk drinker.<sup>71</sup> Little else is known about the use patterns among older adults and the use of multiple substances simultaneously.

### **Coping Style**

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An individual's coping style for stress or tension may predict the development of a drinking problem in late life. An analysis of the Health and Retirement Study revealed that individuals who relied on avoidance coping to deal with stress or solve problems had a greater likelihood of developing and maintaining a late-life drinking problem than those who coped in other ways.<sup>57</sup> Similarly, a community-based survey of older adults who had contact with an outpatient health care facility found that relying on substances to reduce tension was associated with having a late-life alcohol problem.<sup>72</sup>

### **History of Alcohol Problems**

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There are a few studies that identified a history of problem drinking as a risk factor for unhealthy drinking among older adults. Platt and colleagues<sup>57</sup> found there was a significant increase in the likelihood of increasing one's drinking in later life among older adults with a history of drinking problems who did not abstain. Another longitudinal study of a community-based sample found that having drinking problems by 50 years of age significantly increased the likelihood of drinking and/or unhealthy drinking in late life.<sup>58</sup>

### **Social Factors**

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Some social factors are consistently associated with late-life drinking. Being divorced, separated, or single is positively associated with increased or unhealthy drinking in late life,<sup>10,23</sup> though this may differ across sexes. Social contact with friends or close family members among residents of retirement communities was found to be associated with increased alcohol use.<sup>73</sup> In this same study, a lack of religious affiliation was also found to be associated with higher categorical levels of drinking, each of which were defined by an increase in quantity and frequency of drinking. Although increased social interaction is associated with drinking among older adults, social isolation is associated with prescription drug abuse.<sup>36</sup>

Certain life events and social transitions common in late life may also heighten the risk of substance use or misuse. For example, bereavement (death of spouse, family, or friends), physical ill health, loneliness, caregiving for an ill spouse, change in living arrangement, and loss of occupation can all be factors in the substance use of older adults.<sup>74–77</sup> A review of the impact of retirement on older-adult drinking revealed that preretirement conditions, such as high job satisfaction or workplace stress, seem to increase the overall use of and problems with alcohol after retirement.<sup>78</sup> In addition, involuntary retirement and broadened social networks after retirement increase the likelihood of increased alcohol consumption or drinking problems.<sup>78,79</sup> Finally, housing status or living situation can facilitate or sustain substance use. For example, homelessness has been found to be a correlate of late-life drinking problems<sup>69,80</sup>; substance use among older adults has also been found to continue and even be enabled in the context of nursing homes.<sup>81–83</sup>

### **DIAGNOSIS**

The formal diagnosis of SUD in the general population generally relies on the criteria outlined by the *DSM*.<sup>84,85</sup> **Table 1** outlines several symptoms of SUD based on physical and/or social factors. Because of particular biologic and social factors unique to late life, these criteria may be less relevant to older adults. This circumstance presents unique challenges for an accurate diagnosis of SUD among older adults.<sup>16</sup> For example, because of the age-associated physiologic changes that increase the effects of alcohol and other substances, older adults generally experience a reduction of tolerance to these substances, thus interfering with one of the hallmarks of SUD, increased tolerance. Furthermore, interruption in social and vocational roles or other consequences of drinking or drug use may be less likely to occur or less noticeable in old age.<sup>44,86</sup> Aging is often associated with a natural departure from these roles, such as through retirement<sup>78</sup> or social isolation caused by mortality of age-group peers.<sup>87</sup> Furthermore, the criterion related to continued use despite persistent or recurrent problems may not apply to many older adults who do not recognize that their problems, such as depression, are related to drinking.<sup>16</sup>

**Table 1**  
**SUD (formerly substance abuse or dependence) criteria<sup>a</sup>**

***DSM-5* Criteria for SUD**

**Consideration for Older Adult**

A substance is often taken in larger amounts or over a longer period than was intended.

Cognitive impairment can prevent adequate self-monitoring. Substances themselves may more greatly impair cognition among older adults than younger adults.

There is a persistent desire or unsuccessful efforts to cut down or control substance use.

It is the same as the general adult population.

A great deal of time is spent in activities necessary to obtain the substance, use the substance, or recover from its effects.

Consequences from substance use can occur from using relatively small amounts.

There is craving or a strong desire to use the substance.

It is the same as the general adult population. Older adults with entrenched habits may not recognize cravings in the same way as the general adult population.

There is recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or at home.

Role obligations may not exist for older adults in the same way as for younger adults because of life-stage transitions, such as retirement. The role obligations more common in late life are caregiving for an ill spouse or family member, such as a grandchild.

There is continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance.

Older adults may not realize the problems they experience are from substance use.

Important social, occupational, or recreational activities are given up or reduced because of substance use.

Older adults may engage in fewer activities regardless of substance use, making it difficult to detect.

There is recurrent substance use in situations in which it is physically hazardous.	Older adults may not identify or understand that their use is hazardous, especially when using substances in smaller amounts.
Substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.	Older adults may not realize the problems they experience are from substance use.
Tolerance is developed, as defined by either of the following: 1. A need for markedly increased amounts of the substance to achieve intoxication or the desired effect 2. A markedly diminished effect with continued use of the same amount of the substance	Because of the increased sensitivity to substances as they age, older adults will seem to have lowered rather than increase in tolerance.
Withdrawal, as manifested by either of the following: 1. The characteristic withdrawal syndrome for the substance 2. The substance or a close relative is taken to relieve or avoid withdrawal symptoms	Withdrawal symptoms can manifest in ways that are more "subtle and protracted." <sup>149</sup> Late-onset substance users may not develop physiologic dependence; or nonproblematic users of medications, such as benzodiazepines, may develop physiologic dependence.

<sup>a</sup> SUD is defined as a medical disorder in which 2 or more of the aforementioned listed symptoms are occurring in the last 12 months.<sup>85</sup>  
*Adapted from* Barry KL, Blow FC, Oslin DW. Substance abuse in older adults: review and recommendations for education and practice in medical settings. *Subst Abus* 2002;23(Suppl 3):105–31; and *Data from* American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th edition. Arlington (VA): American Psychiatric Publishing; 2013. p. 491.

Using the Item Response Theory with 2009 National Survey on Drug Use and Health data, one study explored whether there were age-related biases among the criteria for AUD.<sup>86</sup> The findings revealed that there were differential responses among older versus middle-aged adults, such that older adults were half as likely as middle-aged adults to endorse the criteria related to tolerance, activities to obtain alcohol, social/interpersonal problems, and physically hazardous situations. The criteria that were most successful in discriminating AUD among older adults were unsuccessful efforts to cut back, withdrawal, and social and interpersonal problems. With the release and adoption of *DSM-5*, a wider proportion of older adults will likely be classified as having SUD than under the *DSM-IV* criteria; however, a large proportion will likely remain unidentified.<sup>86</sup>

As a result of these diagnostic problems, many who study substance abuse in older adults de-emphasize the reliance on *DSM* criteria to identify problematic substance use requiring intervention. Instead, they use a 2-tier categorical classification: at risk and problem use of substances (**Table 2**).<sup>16</sup> At-risk substance use (also referred to as excessive use or hazardous use)<sup>33</sup> is characterized by those who use substances above the recommended or prescribed levels but who experience few or no physical, mental, emotional, or social problems as a result of use. These individuals may be at high risk for the development of such problems and, therefore, still merit thorough screening and secondary prevention.

Problem substance use is characterized by those individuals who are already experiencing problems in the aforementioned areas as a result of their use. Identification of problem use among older adults does not depend on the quantity and frequency of use but on the context in which substances are used. For example, older adults may experience extreme problems with alcohol even when ingesting it at minimal levels because of medical conditions, such as gout or pancreatitis. Although the terms *at risk* and *problem use* are extremely useful in settings such as primary care, they can pose difficulties in helping older adults access more formal treatment, as third-party

Abstinence	No drinking at all and no use of illicit drugs
Low-risk use	Drinking within safety guidelines (7 standard drinks per week, no more than 2 drinks on any one occasion) Only appropriate/prescribed use of prescription or over-the-counter medications No guidelines for low-risk use for illicit drugs
At-risk use (also referred to as unhealthy or hazardous use)	Drinking beyond safety guidelines; drinking while taking medications in which consuming alcohol is contraindicated Intentional or unintentional off-label use of prescription or over-the-counter medications; taking medication, even once in awhile, that is not prescribed directly for that person Any use of illicit substances (primarily because these substance are not quality controlled or standardized)
Problem use	Substance use that results in social, medical, or psychological consequences, regardless of quantity or frequency of substance use <sup>33</sup> Problem user may or may not meet criteria for SUD

payers often require formal SUD diagnoses to justify intensive or more lengthy treatments.

## SCREENING AND ASSESSMENT

Historically, older adults are less likely to be screened for substance use.<sup>88,89</sup> For example, in a study of 400 primary care physicians who were provided with a list of symptoms related to problematic substance use by a hypothetical older female patient, only 1% of physicians considered the possibility of a substance use problem.<sup>16</sup> Although there is an increasing acceptance that older adults should be routinely screened for alcohol and other drug use or misuse,<sup>3,12,35</sup> there are several factors that still inhibit screening and subsequent identification of risky alcohol or other drug use, including the limited time clinicians have to screen for several potential problems or illnesses; the potential stigma related to and discomfort assessing for addiction; the similarities of the symptoms of alcohol and other drug use with other illnesses common in later life<sup>69,90</sup>; and the common perception among older adults that symptoms experienced by the use of alcohol or drugs are seen as a part of normal aging rather than resulting from the substance use itself.<sup>91</sup> Furthermore, older adults are known to have difficulty identifying their own risky behaviors around substance use,<sup>42</sup> making the identification of such behavior even more difficult.

### *Overall Considerations*

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When assessing or speaking to older adults about substance use, some general considerations should apply. Older adults are known to respond more to a supportive, nonconfrontational approach than more assertive styles of assessment and intervention.<sup>92–94</sup> Older adults are far more likely to provide information about potentially stigmatizing behaviors if they think that the clinician is genuinely interested in their overall health and well-being.<sup>44,90</sup> Discussions of alcohol and other substance use should occur in the context of an overall assessment and in reference to the presenting problem with the goal of health promotion and a complete understanding of their health behaviors. Approaching the assessment with the goal of identifying a drug abuser is likely to stigmatize the older adult, engender defensiveness, and is inconsistent with the idea that any drug or alcohol use has the potential to be problematic.<sup>44</sup> Therefore, in a gentle and respectful manner, detailed questions about quantity and frequency of drinking, medications (prescription and over the counter), and illicit drugs (especially marijuana) should be asked with the assumption that this information is important, whether the older adults' use is a problem or not. This reduces stigma by normalizing the behavior without endorsing it.

Many older adults, and even their families, view alcohol use as being their "one last pleasure,"<sup>83</sup> creating a complex picture of substance use in late life. In a study of alcohol-dependent older adults at a Veteran Affairs medical center, older adults were found to be less strongly motivated to change their drinking than their younger counterparts, as they did not perceive their alcohol use as being particularly severe.<sup>95</sup> For some older adults, a foreshortened sense of future may further inhibit motivation to reduce alcohol use. In addition, self-efficacy to reduce drinking may decline with age,<sup>96</sup> depending on the level of control an older adult perceives in his or her life.<sup>91</sup> In addition, low self-efficacy is related to fewer health-promotion behaviors among older adults because they perceive their physical limitations as an unavoidable component of aging.<sup>91</sup>

**Box 2** reviews the potential symptoms or indicators of problematic substance use.

**Box 2****Potential indicators of substance misuse and abuse**

## Physical symptoms or potential indicators

Falls, bruises, and burns<sup>149</sup>Poor hygiene<sup>149</sup> or impaired self-care<sup>69</sup>Headaches<sup>149</sup>Incontinence<sup>149</sup>Increased tolerance to alcohol or medications<sup>149</sup> or unusual response to medications<sup>69</sup>Poor nutrition<sup>149</sup>Idiopathic seizures<sup>149</sup>Dizziness<sup>149</sup>Sensory deficits<sup>69</sup>Blackouts<sup>69</sup>

Chronic pain

## Cognitive symptoms or potential indicators

Disorientation<sup>149</sup>Memory loss<sup>149</sup>Recent difficulties in decision making<sup>149</sup>Overall cognitive impairment<sup>69</sup>Psychiatric symptoms or potential indicators<sup>149</sup>

Sleep disturbances, problems, or insomnia

Anxiety

Depression

Excessive mood swings

## Social symptoms or potential indicators

Family problems<sup>149</sup>Financial problems<sup>149</sup>Legal problems<sup>149</sup>Social isolation<sup>149</sup>Running out of medication early<sup>44</sup>Borrowing medication from others<sup>44</sup>

Assessments should start with questions about drinking, medication use, and illicit substances. The focus should be on the facts of substance use rather than questioning the person's judgment (eg, do you have a drinking or drug use problem?).<sup>44</sup> During this discussion, questions about overuse and misuse can be included in a nonjudgmental way.<sup>44</sup> For instance, asking a patient whether they sometimes take an extra pill to fall asleep or to cope with pain, run out of medication early, or borrow medications from others may provide important information and a gateway to further discussion about problematic use of substances.<sup>44</sup> It should be noted that even if the older adult is currently abstinent from alcohol and other drugs, questions about use or

misuse in the past are also important, as the answers may indicate increased vulnerability to other psychiatric disorders or cognitive decline.<sup>33</sup>

### **Screening Tools**

Brief screening instruments can assess the level of risk caused by alcohol and drugs. Some screening tools are adaptations of instruments created for younger adults, and others have been designed for older adults. Interview screening tools or global self-report measures are less intrusive or burdensome to the older adult than blood or urine tests. Furthermore, the use of biologic screening (ie, laboratory tests) has limited utility and can be problematic in older adults, as isolating impaired bodily functions (ie, liver function) as the result of alcohol or other substances versus prescribed medications may be difficult. Each of the instruments listed next have strengths and weaknesses related to resources required to implement them or applicability to older adults.

#### ***CAGE-Adapted to Include Drugs (CAGE-AID)***

The most common screening tool for substance misuse is the CAGE questionnaire, which focuses on the potential for alcohol dependence. The CAGE was later adapted to assess for alcohol *and* other drugs and called the CAGE-AID.<sup>97</sup> The CAGE-AID contains the following 4 questions:

1. Have you ever felt that you should **C**ut down on your drinking or drug use?
2. Have people **A**nnoyed you by criticizing your drinking or drug use?
3. Have you ever felt bad or **G**uilty about your drinking or drug use?
4. Have you ever had a drink or used drugs first thing in the morning to steady your nerves or to get rid of a hangover (**E**ye opener)?

The questions can be adapted to a specific substance, such as a prescription medication, and they can be asked either in the context of an interview or self-administered. One or more positive responses are considered a positive screen. Psychometric properties of the CAGE-AID have not been reported, yet the CAGE has been extensively studied. The CAGE has been validated in an older-adult population, demonstrating as high as 86% sensitivity and 78% specificity for a score of one or more<sup>56,98</sup>; however, the CAGE may identify a different group of drinkers than other measures, such as the Short Michigan Alcoholism Screening Test–Geriatric Version (SMAST-G), and it does poorly in detecting heavy and binge drinkers.<sup>99</sup> Furthermore, it has not performed well in the psychiatric population.<sup>100</sup> A major limitation of the CAGE-AID is that it does not distinguish between current and lifetime use, an especially difficult issue among the aging, who may have a history of problematic use without having a current problem. Because of the brief nature of the CAGE-AID, it can be a useful screening tool; but it should not be a substitute for a more thorough assessment, such as consumption levels, consequences of use, and functional deficits.

#### ***The Michigan Alcohol Screening Test–Geriatric Version***

The Michigan Alcohol Screening Test–Geriatric Version (MAST-G)<sup>101</sup> is an instrument designed to identify drinking problems and was developed specifically for the elderly by modifying the Michigan Alcohol Screening Test. This screening tool contains 24 questions with yes/no responses; 5 or more positive responses indicate problematic use. The MAST is highly sensitive and specific and generally has strong psychometric properties.<sup>102</sup> It is also administered in a short form, the SMAST-G, which has 10 questions, with 2 positive responses indicating a problem with alcohol. Because of the diagnostic challenges outlined earlier, the MAST-G focuses more on potential stressors and behaviors relevant to alcohol use in late life, as opposed to questions

toward family, vocational, and legal consequences of use. This tool has many of the advantages of the CAGE, such as ease of administration and low cost. It is also more specific than the CAGE in identifying problematic use. Although useful as an indicator of lifetime problem use, it lacks information about frequency, quantity, and current problems important for intervention.

### ***The Alcohol Use Disorders Identification Test***

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Developed by the World Health Organization (WHO), the Alcohol Use Disorders Identification Test (AUDIT) assesses for current alcohol problems.<sup>103</sup> The test consists of 10 questions pertaining to amount and frequency of use, alcohol dependency, and the consequences of alcohol abuse; it can be administered through an interview or self-administered. Each of the 10 questions is scored on a 4-point continuum, with total scores ranging from zero to 40. The AUDIT was validated in older adults to detect problematic or hazardous use.<sup>104</sup> Although the cutoff threshold to indicate AUD among a general population is 8, a cutoff threshold of 5 was identified to indicate AUD among older adults.<sup>100,105</sup> Five items on the AUDIT (items 1, 2, 4, 5, and 10) are particularly sensitive and specific to AUD among older adults and together have outperformed the full AUDIT and the CAGE.<sup>105</sup>

### ***The Alcohol, Smoking, and Substance Involvement Screening Test***

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The Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) is another instrument developed by the WHO to screen across substances for potential problem use.<sup>106</sup> It is an interview-based tool that consists of 8 questions that help identify the level of risk to help guide decisions for intervention. The ASSIST has yet to be validated among older adults, and there is at least anecdotal evidence that it underperforms in this population in part because of the same limitations with a formal *DSM* diagnosis; the criteria do not apply in the same way for older adults as they do with younger adults.

### ***The Comorbidity-Alcohol Risk Evaluation Tool***

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The Comorbidity-Alcohol Risk Evaluation Tool (CARET)<sup>107</sup> is a screening instrument whose precursor is the Short Alcohol Related Problems Survey.<sup>108</sup> It identifies older adults who are at risk because of the quantity and frequency of their alcohol consumption, presence of comorbid diseases, high-risk behaviors (such as drinking and driving), and concomitant use of medications whose efficacy may be diminished or that may interact negatively with alcohol. It has demonstrated good face, content, and criterion validity with older adults.<sup>107–109</sup> One of the strengths of the CARET is that it identifies hazardous alcohol use apart from simply the quantity and frequency of drinking, accounting for a wider spectrum of unhealthy use that could present dangers more common in later life. As a result, the CARET identifies at-risk or problem alcohol use among older adults with more sensitivity than the AUDIT and the MAST-G.<sup>107</sup> Most older adults identified as at-risk drinkers using the CARET are identified as such because of their use of alcohol with medications.<sup>110</sup>

## **INTERVENTIONS**

A continuum of treatment options are available for older adults, depending on the setting and the severity of the problems indicated.<sup>44</sup> Contrary to the assumption that older substance users are stuck in permanent patterns of use, older adults have demonstrated treatment outcomes as good, or better, than those seen in younger groups<sup>111,112</sup>; however, access to specialized services tailored for older

adults is limited. A national survey of substance abuse treatment programs found that only about 18% were specifically designed for older adults.<sup>44,113</sup> Even if programs were available to them, overall, mental health utilization rates are lower among older adults than any other age group.<sup>39</sup> Some of the barriers to specialized treatment that older adults face include stigma and shame surrounding substance use and related problems, geographic isolation, inability to pay, or difficulties with transportation.<sup>16,114</sup> Interventions in nontraditional settings, such as emergency rooms, senior centers, and primary care offices,<sup>44,115</sup> have been implemented in an attempt to reach vulnerable older adults outside the formal treatment system.

Because, in part, of the relative invisibility of older-adult substance use and SUD, relatively little published research exists on the efficacy and/or effectiveness of substance abuse treatment of older adults.<sup>112</sup> In a recent review of research on substance abuse treatments for older adults,<sup>112</sup> the researchers found a relative absence of published, rigorous, internally valid research. Therefore, the review of interventions discussed later is of those treatments for which there is some initial evidence of efficacy and/or effectiveness among this population.

### **Brief Intervention**

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Effective brief interventions<sup>110,116,117</sup> occur in primary care settings, focus on alcohol and prescription medication misuse or abuse, and vary in length from 15 minutes to five 1-hour sessions.<sup>90,112</sup> Their purpose is to provide education about the substance and how it might be harmful, enhance motivation for change, and connect severe users with more intensive treatments,<sup>42</sup> when necessary. Normative feedback, in which a patient's drinking is compared with his or her peers, combined with brief advice is one of the most common brief interventions used and seems to be highly effective for older-adult drinkers.<sup>19,112,117</sup>

Most brief interventions are described as using aspects of motivational interviewing (MI)<sup>118</sup> or motivational enhancement therapy (MET),<sup>119</sup> which encourages a client-centered, nonjudgmental approach to discussing substance use and encouraging positive, healthy changes to the individual's life. Formal MI and MET aim to reduce ambivalence by assisting the client to identify in his or her own words the perceived pros and cons to making a change versus maintaining the status quo.<sup>44</sup> For the older adult, the reasons for change may include maintaining independence, optimal health, and mental capacity.<sup>90</sup> Although MI and MET are consistent with a nonconfrontational supportive approach, there is little evidence to suggest that formal MI works with older adults in regard to substance use. No studies among those that contributed to establishing MI as an evidenced-based practice included individuals older than 62 years.<sup>120</sup> Some studies demonstrate efficacy of MI with older adults targeting other health behaviors,<sup>121</sup> including smoking cessation<sup>122</sup>; some evidence suggests that it works in the context of case management to engage older adults in more formal treatment.<sup>19</sup> Rigorous controlled trials of older adults and MI, or any other treatment, have yet to be conducted.

### **Pharmacology**

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A growing number of pharmacologic treatments can be used for SUD. Most of the research to date with older adults has been done on medications treating smoking cessation and alcohol use. Disulfiram, acamprosate, and naltrexone are medications approved by the Food and Drug Administration that are used to treat SUD; other medications, such as varenicline, are just emerging. Medication options for older adults are more limited than those in the general population, as evidence is lacking still about the efficacy and safety for some of these medications for an older population. Disulfiram

is an aversive agent that increases the ill effects of alcohol ingestion by increasing acetaldehyde levels.<sup>123</sup> Although it has been used with adults older than 50 years with some benefit,<sup>124</sup> it has limitations. Disulfiram is only useful with strict adherence to the medication. There is also evidence that it places extra strain on the cardiovascular system within older adults and, thus, may be contraindicated.<sup>123</sup>

Acamprosate is an NMDA and GABA receptor modulator used to reduce craving and the pleasant effects of alcohol.<sup>123,125</sup> No trials have been conducted to examine the efficacy of acamprosate for individuals aged 65 years and older. Because of the few reports of adverse effects across populations, it is considered relatively safe among older adults.<sup>126</sup> In younger adults, 2 to 3 g of acamprosate is the recommended dose<sup>123</sup>; it has been tested in trials of 16 weeks<sup>127</sup> to 1 year in length.<sup>128</sup>

Naltrexone is the most well-studied medication used for SUD treatment among older adults,<sup>112</sup> and it has demonstrated some effectiveness with this population. Naltrexone is an opioid receptor antagonist thought to reduce craving and the pleasurable or stimulating effects of alcohol by blocking alcohol-induced dopamine release in the brain.<sup>123</sup> It can be taken daily or as needed, although only daily treatment of naltrexone has been tested with older adults. The standard dose of naltrexone is 50 mg, but some studies have investigated its effects at larger doses (eg, 100 mg). The major limitation of naltrexone in an older-adult population, many of whom have chronic pain, is that it blocks the effect of opiate-based pain medications. It can also potentiate preexisting major depressive disorder symptoms. Patients with histories of comorbid depression should be closely monitored.

Two randomized controlled trials examined the impact of naltrexone versus placebo on older adults.<sup>129,130</sup> In one study, 44 male veterans aged 50 years and older were randomly assigned to 50 mg/d of naltrexone or placebo and followed for 12 weeks.<sup>129</sup> In addition to the medication, each participant also received weekly group therapy and case management. There were no significant differences between medication conditions on abstinence or relapse rates; however, among those individuals *exposed to alcohol*, older adults on naltrexone were significantly less likely to relapse than those on placebo. In a study of 183 adults,<sup>130</sup> two-thirds of the subjects were randomly assigned to receive 100 mg of naltrexone and one-third to placebo during 3 months of treatment. All participants received a medication management intervention with qualities similar to age-specific treatments, such as a nonconfrontational style.<sup>131</sup> In a post hoc analysis, participants were divided into 2 age groups: 21 to 54 year olds and those 55 years old and older.<sup>130</sup> Older adults demonstrated significantly greater rates of treatment engagement and medication adherence than the younger adults; however, only a trend level difference was found in medication effects between older and younger adults. Small sample sizes of older adults may have impeded the ability to detect significant main effects in both studies.

Varenicline is a nicotinic agonist that is a now widely used to aid smoking cessation.<sup>132,133</sup> It has also recently been applied to alcohol dependence in a similar fashion as naltrexone.<sup>134</sup> Although there are relatively few studies on varenicline with alcohol, existing studies demonstrate a reduction in drinking overall<sup>135</sup> or a reduction in heavy drinking<sup>134</sup> among a general population. No research yet exists on its effect with older adults.

### Case Management

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Case and care management models, which are offered in primary care settings or community-based agencies, take advantage of nontraditional settings to engage older adults in reducing their use and/or connecting them to treatments.<sup>44</sup> These interventions offer several advantages to an older-adult population. First, they provide a

comprehensive approach by addressing the complexity of medical and psychiatric comorbidities common in this population<sup>16,90</sup> while also connecting isolated older adults to needed community resources. Another advantage of these interventions is that substance use interventions are embedded in a broad approach to addressing health, lessening stigma, and also working toward a likely common goal among older adults: overall better health.<sup>16</sup> Program evaluations of this model support the notion that case management is an important tool in working with this population.<sup>136–140</sup> Case management models may be particularly effective at engaging and maintaining older at-risk drinkers in treatment.<sup>138</sup>

### ***Types of Care Available in the Formal Treatment System***

As with younger populations, formal substance abuse treatment of older adults is provided on a continuum of intensity depending on problem severity, ranging from detoxification to outpatient treatment or aftercare.<sup>44</sup> All treatment plans should be individualized and flexible according to the specific needs of the client. Because of the unique issues facing older adults, both individual and group treatments are recommended. Although group treatment can reduce isolation and shame related to substance use and is often the preferred method of providing substance abuse treatment, the lack of elder-specific treatment available in the community<sup>113</sup> may actually enhance feelings of isolation and shame in a group context. Older adults may not easily relate to or feel uncomfortable discussing their problems with younger persons. Individual therapy provides a private and confidential forum for older adults to explore their unique issues, without these same risks.

Two psychosocial and psychotherapeutic approaches have been explored specifically in the context of older adults: supportive therapy models (STM)<sup>141</sup> and cognitive-behavioral therapy (CBT).<sup>92–94,142,143</sup> STM represent traditional treatment with age-specific modifications. Twenty-five years ago, STM approaches arose out of a concern about whether older adults could effectively engage in standard treatment.<sup>141</sup> It was observed that confrontational approaches were ill suited and disrespectful to older adults and that the unique issues faced by older individuals, including health conditions, depression comorbidity, and social isolation, went unaddressed.<sup>16</sup> Although it is now widely accepted that confronting denial in any individual about their drug or alcohol use is ineffective in helping individuals modify their behavior to be more healthy,<sup>118</sup> STM were designed to focus on developing a culture of support and successful coping for older-adult substance abusers; supportive therapies concentrate on building social support, improving self-esteem, and taking a global approach to treatment planning through addressing multiple biopsychosocial arenas in the client's life.<sup>44</sup> Although there has been relatively little research on age-specific treatments incorporating these techniques, there is at least some evidence that older adults demonstrate better outcomes in these settings than in nonadapted settings.<sup>112,141,144</sup>

CBT focuses on identifying and altering sequences of thinking, feeling, and behaving that lead to problem drinking or drug use.<sup>145</sup> CBT can be delivered individually or in group settings, and there is strong evidence for positive outcomes across populations and age groups.<sup>146</sup> There is also evidence for the effectiveness of CBT with older adults,<sup>92–94,142,143</sup> and the Substance Abuse and Mental Health Services Association published a CBT treatment manual specific to substance-using older adults.<sup>16</sup> The highly structured, didactic approach taken in CBT may be particularly helpful to older adults because of the tendency to present with memory difficulties.<sup>16</sup> Finally, CBT interventions have outperformed nicotine replacement therapies among older adults participating in a smoking cessation program.<sup>27</sup>

## SELF-HELP GROUPS

Alcoholics or Narcotics Anonymous and their related groups can be useful to older adults in reducing isolation, shame, and stigma,<sup>44</sup> though there have been no systematic studies on the effects of these groups on older adults.<sup>147</sup> Older adults may encounter the same barriers to participation in self-help groups as they do with formal treatment: primarily stigma and shame of needing to attend to these issues in late life in the presence of a younger generation. Older generations of older adults whose primary substance is alcohol may also experience more discomfort in attending meetings that include younger polysubstance users,<sup>147</sup> though this may be less of an issue for baby boomers. Furthermore, specific meetings may be more or less suited to older adults given the variation in the pace of meetings and the general focus of the group. Some experts have recommended traditional self-help groups be modified for older adults, such as slowing the pace of the meeting to reflect cognitive changes in aging and devoting attention to handling losses and extending social support.<sup>148</sup> Being aware of elder-friendly meetings in the geographic area may be helpful for intervening with older adults. When referring to self-help groups, it is also important to encourage older adults to try more than one meeting before deciding whether it is a good fit because each meeting has a unique tone and feel.

## SUMMARY

The myth that older adults do not use substances and/or do not use substances problematically has been dispelled. Older-adult substance users may not present with the same symptoms as their younger counterparts and, therefore, may be more difficult to identify. Treatment options remain generally limited, as few programs or health care settings offer tailored interventions for older adults. Health care professionals need to continue to do as thorough of assessments as possible and enlist the help of formal measures, Web-based assessment, and build in the questions outlined earlier as routine. As the baby boom generation ages, the health care system will be challenged to provide culturally competent services to this group, as they are a unique generation of older adults. Knowledge about older-adult substance use and the issues that contribute to late onset or maintained addiction in late life will need to be continually updated as we learn how and why this generation of adults uses substances. Furthermore, the advancement and development of interventions that may be more useful for, effective for, and desired by this incoming generation of older adults than previous generation, such as mobile interventions, will be crucial to alleviating the projected pressures on the health care system.

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# Appendix C

Birgit Koechl, Age-Related Aspects of Addiction, 58  
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# Age-Related Aspects of Addiction

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## Key Words

Addiction · Substance use · Substance abuse · Substance dependence · Prescribed medication · Alcohol · Age · Gerontology

## Abstract

Research has shown that substance use, abuse and addiction are not limited to a specific age group. Problems related to substance addiction are an important cause of morbidity in the population aged 65 years and above, especially the abuse of prescription drugs and legal substances. A lack of evidence-based studies and tailored treatment options for the aging population is evident. Appropriate and effective health care is an important goal to improve the health-related quality of life of elderly people. Research in the increasingly aging population needs to include an age- and gender-sensitive approach.

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## Introduction

Age-related aspects of addiction are an increasingly important public health challenge due to a growing number of affected individuals. In most developed countries, people with a chronological age of 65 years or older are considered to be elderly or are in retirement [1]. Individuals from 15 to 64 years of age are defined as the 'working-age population'. During this century, the number of European individuals aged 65 years and older has tripled, and life expectancy has doubled [2]. One disregarded as-

pect of these definitions is that a lot of individuals aged 65 years or more are still working, and others retire early.

The definition of an older person published by the World Health Organization is used in the current viewpoint, as described above [1]. In order to integrate all interesting publications, the respective exact age of the described population is referred to in the course of this article, with a clear focus on individuals of 50 years and above. Relevant terms such as 'addiction', 'substance dependence', 'substance abuse', 'substance use', 'alcohol', 'prescribed medication', 'illicit substances', 'licit substances' and 'drugs' combined with 'gerontology' or 'age' were systematically searched via PubMed.

In clinical research and practice, substance misuse and dependence (fulfilling the criteria of standardized diagnostic international classification systems such as ICD-10 and DSM-IV [3, 4]) are often misconceived as issues affecting only the younger population. However, such problems have, indeed, no age limits [2]. It is estimated that the number of people aged 50 years and above in need of substance-related addiction treatment will increase by 300% in the USA from 1.7 million in 2000/2001 to 4.4 million in 2020 [5].

Abuse of licit and illicit substances by the elderly is associated with a wide range of health risks, social exclusion and isolation. Aging is often characterized by social, psychological and health problems, which in turn are risk factors for substance misuse and dependence [2]. Substance use disorders are often ignored, unrecognized or misdiagnosed. Addiction can be mistaken for depression or dementia in elderly persons, which explains why the prevalence of addiction in the elderly is underestimated

[6]. Polypharmacy in particular is a common problem in this population. An effective method of conveying the benefits of reducing the number of medications is needed to improve quality of life [6].

Social isolation is a key risk factor for morbidity and mortality, becoming more common with increasing age due to lack of support and loneliness; the latter is also a problem in residential care and elderly homes [7]. Reasons for loneliness/isolation include widowhood, no children, living alone, deteriorating health, limited companionship and other negative life events [8, 9].

Individuals (mean age 64–86 years) who suffer from addiction show an increased incidence of concomitant medical and psychiatric symptoms. With regard to physical health, a higher risk of dental problems, accelerated aging processes of the brain and an increased probability to develop diabetes (type 2) are evident. Furthermore, an increase in co-occurring psychiatric disorders is observed, with the exception of posttraumatic stress disorder [6]. Specific instruments of assessment for the elderly (especially for individuals 65 years and older) need to be developed. These could serve as a basis for generating valid diagnoses in order to provide specialized and effective treatment.

### **Gender Issues**

Addiction in women aged 50 years and older is an underestimated issue and has only recently become a larger public health topic. Women are less frequently diagnosed with addiction disorders and often show manifest problems at a later age than men (60 years or older) [10]. In the USA, the prevalence of substance abuse in older women was estimated at 11% in research studies and has been increasing. Female gender, social isolation, depression and a history of substance abuse were identified as risk factors for developing substance-related disorders in old age ( $\geq 50$  years) [11–13].

There are remarkable gender differences found in the mental and physical health status of older adults in opioid maintenance treatment; men more frequently report physical symptoms while women report more psychiatric ones [14]. In a very recent study, individuals (mean age 58.3 years) with a history of heroin dependence showed poorer health outcomes compared to the general population. Women reported an earlier start than men with worse chronic and mental health problems [15]. Regarding the treatment of older drug-dependent individuals, detoxification is more successful than it is in the young,

but ambivalent sentiments in health care demand and supply are very common in the older population [6]. However, appropriate and effective health care is important to improve health-related outcomes and quality of life and to ensure the accommodation of gender-specific treatment needs.

### **Licit Substance Use/Abuse or Dependence in the Elderly**

Alcohol abuse and polypharmacy are the main issues in this group of patients. Current problems in the elderly originate in the medical and nonmedical use of prescription drugs, frequently combined with self-medication in the form of alcohol abuse. A large number of very elderly patients suffer from somatic comorbidities, resulting in polypharmacy with 5 or more concurrent medications [6]. The issue of illicit substance abuse is a less serious problem compared to individuals of younger age.

Regarding gender differences, older women tend to abuse prescription or over-the-counter drugs, while men are more frequently reported to abuse alcohol. Addicted older women present special challenges in identification and intervention and have specific needs with regard to treatment [16, 17]. Bereavements of close relatives or their husband and the alteration of life circumstances through retirement are an additional burden [10].

### **Prescription Medication**

About 25% of prescribed medications in the USA are provided to older subjects [2]. Increasing prevalence is observed and estimated at one third of all prescribed substances. Among them, benzodiazepines and opioid analgesics are frequently prescribed to individuals aged 65 years and older [10–12]. This can result in physical dependence, while tolerance and withdrawal symptoms are generally less common in this population [11].

There is evidence that many patients are diagnosed with insomnia, anxiety and/or depressive disorder and receive long-term prescriptions for benzodiazepines, but an international prescription guideline has not been established [11, 12]. The use of benzodiazepines for 1 year or longer is common in 95.6% of older primary care attendees (65–84 years) in Italy, regardless of whether a psychiatric disorder is diagnosed or not [18]. Results regarding benzodiazepine abuse in these individuals showed that 785 individuals (of the 1,156 individuals who par-

ticipated by completing a questionnaire evaluating mental health problems, the so-called Primary Care Evaluation of Mental Disorders) had at least one psychiatric diagnosis and were often using benzodiazepines. Most of the patients received their first prescribed benzodiazepines from general practitioners, in most cases for long-term therapy.

Of the subjects with anxiety disorders, 19.7% started benzodiazepine treatment as an inpatient, compared to only 13.7% of patients with depressive disorders. Sleeping disorders were observed in 50–85% of the sample, independent of psychiatric diagnoses. Patients with anxiety and depressive disorders received their prescription for benzodiazepines mostly from psychiatrists (15.7%). About three quarters of the dispensed benzodiazepines were medium- or long-term acting benzodiazepines. Anxiolytic benzodiazepines were consumed more frequently than hypnotic benzodiazepines, and about 25.4% of all benzodiazepine users reported to have consumed antidepressants at least once in their life [18].

## Alcohol

Epidemiological data of 6,717 subjects aged 50–64 years and 4,236 subjects aged 65 years and older (i.e. 10,953 subjects of 50 years and older) from 2005 to 2009 showed that nearly 60% had used alcohol the year before by means of self-assessments (mean number of days of substance use was 103.53; 62% used alcohol on 30 days or more, 14% on 12–29 days, 18% on 3–11 days and 6% on 1–2 days) [19]. Alcohol use was far more frequent in subjects aged 50–64 years and among men. An increased incidence of physical health problems is associated with drinking at an older age [2].

An estimated 1.8 million women in the USA show alcohol-related problems, and about 11,000 women are in treatment. The prevalence of consumption in excess of the recommended amount of alcohol (recommendation for older persons, especially if health problems or medication that could interact is used: 1 drink a day or 2 drinks on occasion) in the population aged 60 and above is estimated at 30% for men and 15% for women [2, 20]. Women are less likely to be heavy drinkers ('once a month' or more, 5 or more alcoholic drinks on one occasion in the past 12 months) than men (11.1% compared to 29.0%), but most male adult drinkers aged 18 years and older are not diagnosed with alcohol dependence [21]. Depression or anxiety disorders are very common in persons who are alcohol dependent and often contribute to social isolation.

Epidemiological studies suggest that about 2–20% of elderly individuals abuse alcohol or are hazardous drinkers; alcohol dependence is estimated at 4% [22–25].

## Illicit Substances

The prevalence of illicit drug abuse or dependence in people aged 50 years and older is very low (only 0.33% for any abuse or dependence, 0.12% for marijuana abuse or dependence and 0.18% for cocaine abuse or dependence) according to the literature [5, 19]. About 2.6% used marijuana and 0.41% cocaine in the prior year. Nevertheless, the use of marijuana approached 4% in the 50–64 years age group in comparison to 0.7% in the 65 years and older age group.

Drug use was far more frequent in subjects aged 50–64 years and among men. The estimates on prevalence show that drug use is very low in this population, but that the prevalence may rise substantially in the 65 years and older age group when individuals of middle age become older [5, 19]. Drug use, in contrast to alcohol use, was not associated with education and was more common among unmarried individuals and those with major depression [19].

## Excursion: Important Aspects of Opioid Maintenance Treatment

Opioid maintenance treatment is a very effective form of treatment and the only treatment of substance-related disorders with very good evidence [16, 17, 26]; about 10% of patients in opioid maintenance treatment are over 50 years old [2]. The percentage of adults aged 50 years and older in opioid maintenance therapy increased from 5.5% in 1994 to 15.6% in 2004 [14]. In 2007, nearly half of the patients in opioid maintenance treatment in Austria were 35 years and older. It is important to mention that the physical aging process is faster in drug-abusing subjects, depending on their life circumstances (e.g. access to drugs with good quality).

The prevalence of mental and physical health disorders among 140 patients over the age of 50 was examined in a study using face-to-face interviews in a free-standing methadone clinic in a Midwestern industrial city [14]. More than half of the patients had had physical health problems and at least one mental health disorder in the last year. High rates of arthritis and hypertension, depression, anxiety disorders and (in contrast to other re-

sults) posttraumatic stress disorders were reported. Women showed higher levels of depression, agoraphobia and panic disorders than men, and men showed higher rates of hypertension and diabetes than women. Patients in methadone programs show worse health in comparison to the norm population [14].

Benzodiazepine consumption needs to be assessed carefully in opioid maintenance patients. The dispersion of benzodiazepines decreased significantly between 2002 and 2005 in Austrian patients in opioid maintenance treatment. In 2008, about 27% of adult patients had accompanying benzodiazepine prescriptions during opioid maintenance therapy. Many adult patients are prescribed concurrent benzodiazepines (27%) by a secondary physician [27].

Interesting results in older individuals who received opioid medications for chronic pain ( $n = 163$ ) were found in a cross-sectional research design at the Baltimore Veteran Medical Center. The results illustrate that depression is an underdiagnosed but treatable comorbidity in patients with pain (40% of them showed depressive symptoms) that should be evaluated in older patients receiving opioid medications. Undertreatment of depression in chronic pain patients may explain the lack of improvement in pain and functional status despite adequate opioid dosage [28].

### Prospects and Conclusions

Senior drug users were an unnoticed marginal group in the past. However, based on sociodemographic developments, older individuals with addiction problems are becoming a very important group, especially considering the expected increase in numbers over the next decade [2, 29]. The elderly are currently underrepresented in clinical trials in this field and in evidence-based treatment recommendations. It is also important to note that patients aged 50–54 years show worse physical and mental outcomes compared to normal controls aged 55–67 years (by sample composition; inclusion criterion: persons of at least 50 years), which reflects increasing health problems and gender-sensitive approaches [14].

Indeed, not only the elderly, but also women, special minorities and individuals with disabilities are underrepresented in the literature and the treatment system [25, 30]. A very important aspect is to be aware of the overlap between menopausal symptoms and those of opiate withdrawal. Patients in this age group estimate in self-report measures to be of poorer health compared to the

general population [14]. Further research is also needed to bridge gender gaps and the disparity of underlying causes of substance dependence.

The incorporation of gender mainstreaming into public health policy is essential, because both gender and age are important considerations in the treatment of dependence. In the future, trained clinicians in geriatrics and substance abuse will be needed for the growing and aging substance-abusing population [14]. Training and education of general practitioners regarding benzodiazepine prescription is very important to ensure safe and effective treatment. The reduction of benzodiazepine prescriptions is necessary in the adult population, but this is a general problem that does not only affect the elderly [27].

The literature focuses on rehabilitation and on problems with prescribed medications or the abuse of alcohol, but problems with other substances are not well evaluated and not subject to investigation. Furthermore, several limitations of the selected studies have to be mentioned, such as quality of the data, representativeness of the study sample, study design and implementation. Self-reported data about substance use are often not objective and valid and should be combined with objective methods, for example urine toxicologies, which are often not conducted.

Individuals with drug problems should have the same claims as other citizens, although the aging population in particular has problems getting active counseling or help. They are often in need of care or support, but a hidden anxiety because of the legal situation or shame keep them from seeking help. Treatment should be provided to affected individuals, regardless of whether they need therapy pertaining to general or specific, physical, psychological or psychiatric problems.

Polypharmacy in the elderly increases health service costs and creates difficulty for health professionals. Research shows that nonpharmacological interventions like increased psychological care or having a confidant improves psychological and health-related outcomes [8, 9]. Furthermore, the number of prescribed medications can be reduced and the problem of social isolation and immobility can be improved [8, 9]. One of the most important interventions in this field is to speak to older, isolated individuals, who are often in need of social contact. This is also the first step to providing information or motivation for further treatment or support, if needed. The nonpharmacological, psychoeducational approach is therefore very central.

A lack of evidence-based research (efficacy and epidemiological studies) often prohibits exact evaluation and

interpretation of the signs and symptoms of addiction. Therefore, orientation towards better scientific standards must be established in investigations studying age and gender differences in addiction [31]. As a consequence, the consideration of age- and gender-related aspects with appropriate assessment and treatment of the elderly should be implemented in clinical practice and research. Interdisciplinary work in a multiprofessional team is most recommendable.

The selection of research studies chosen for this viewpoint represent an excerpt of the studies about addiction in older individuals and mark the beginning rather than

the end of the scope of 'addiction and aging'. Training for therapists in terms of age-related aspects of addiction in assessment and treatment should be provided, to avoid overmedication and misdiagnosis. Psychoeducation has to become more diversified and adapted to meet the needs of elderly patients.

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