



Brief Reviews

# Use, Effects, and Diagnostic Challenges of Cocaine Use in “Baby Boomers” and Older Adults

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## Abstract

**Introduction:** Substance use disorder (SUD) is frequently recognized in the literature as an epidemic in the United States, but less attention has been paid to the scale of the epidemic among people older than 60 years of age. As the cohort of individuals in this age group grows as a proportion of the population—the so-called aging of the population—the incidence of SUD in older adults will increase numerically as well. While most existing literature on SUD in the elderly has focused on alcohol, opioids, and prescription drugs, the number of users of stimulant drugs like cocaine and methamphetamine is also growing. We review literature on the use, effects, and diagnostic challenges of cocaine in adults in the so-called “Baby Boomer generation” (ages 59-77 in 2023), particularly those  $\geq 65$  years. **Methods:** We performed a literature review of PubMed and Web of Science databases, supplemented by Google Scholar using combinations of “cocaine,” “elderly,” and “older adults.” We searched the reference sections of particularly salient articles and utilized PubMed’s and Google Scholar’s “Cited By” and “Similar Articles” functions to find additional materials to include. We produced an annotated bibliography containing title and author information for each paper along with its abstract to select the papers to include; each author reviewed this bibliography to determine if articles were relevant, and if so, in which section(s) the material should be included. A total of 66 references have been included in this review. **Results:** Both lifetime and current cocaine use appear to be more prevalent among members of the “Baby Boomer generation” than older cohorts. Though there has been limited research to inform clinical care for older adults who use cocaine, negative physical and psychosocial impacts have been noted in the literature. Cocaine use disorder may negatively affect the elderly more than younger users because of the increased vulnerability of their aging bodies to the physiological and cognitive effects of cocaine. Underdiagnosis of cocaine use in the elderly may be attributable to the assumption that any presenting symptoms are due to pre-existing medical conditions or that older adults are less likely to consume cocaine. **Conclusions:** There is little information currently in the literature to help clinicians understand patterns and epidemiology of cocaine use, its effects on older adults and their common presentations after experiencing adverse events, and challenges of diagnosing and treating cocaine use in older adults. Additional research is needed to describe use and effects of cocaine on the elderly, particularly on age-related comorbid conditions and interactions with medications.

## INTRODUCTION

Substance use disorder (SUD) is frequently recognized in the literature as an epidemic in the United States, but less attention has been paid to the scale of the epidemic among people older than 60 years of age. As the cohort of individuals in this age group grows as a proportion

of the population—the so-called aging of the population—SUD instances in older adults will increase numerically as well. The US population of older adults—defined as those age 65 years or older—is expected to reach 70 million, comprising 20% of the population, by 2030. Along with other older adult groups, those who misuse substances are also living longer than ever before, and

their population is also growing.<sup>1-3</sup> This is particularly salient for hospital-based health care providers; a large proportion of hospital admissions are of older adults. A study from the Agency for Healthcare Research and Quality found that the rate of hospitalization per 100,000 among people 65 and older was more than double that of those aged 45-64 (>26,400 per 100,000 versus 10,400-11,700, respectively).<sup>4</sup>

The problem of SUD is not just a result of the size of the so-called “Baby Boomer” generation (those born circa 1946-1964). Prior to the COVID-19 pandemic, “baby boomers” had longer life expectancies compared to earlier generations, and lifetime use of drugs is much more common than among older adults, due in large part to changing cultural norms around substance use and higher lifetime levels of exposure.<sup>5-7</sup> Studies have shown a lifetime substance use prevalence of 47.4% in “baby boomers,” which is much higher than previous geriatric cohort, whose rate of lifetime substance use was 19.3%—less than half that of the “baby boomer” cohort.<sup>1,8</sup> Having lived through the cultural changes associated with the 1960s onward including events such as the Woodstock era, disco revolutions, and the cocaine parties of the 1980s, it is no surprise that “baby boomers” have different perceptions and habits of drug use than did their elders.<sup>9</sup> The literature indicates that among some “baby boomers,” drug use remains a persistent behavior throughout life.<sup>10,11</sup>

The need for SUD treatment amongst older adults is also expected to grow in coming years, equally across all races, genders, and ages.<sup>8,12,13</sup> Despite these trends, multiple studies have found that SUD in the elderly is under-identified, under-diagnosed, and under-treated, possibly due to low clinical suspicion and denial of substance use by the elderly and their care takers, in addition to misconceptions among healthcare providers.<sup>12,14-21</sup>

While most existing literature on SUD in the elderly has focused on alcohol, opioids, and prescription drugs, the number of users of stimulant drugs like cocaine and methamphetamine is also growing.<sup>2,3</sup> There is evidence that use among this population is significant—the US Substance Abuse and Mental Health Services Administration estimates that each day, 4300 individuals age ≥65 years use cocaine.<sup>22</sup> There is little information currently in the literature to help clinicians understand patterns and epidemiology of cocaine use, its effects on older adults and their common presentations after experiencing adverse events, and diagnosing and treating resulting cocaine-related conditions. In addition, the existing literature uses a wide range of age categorizations, from the National Survey of Drug Use and Health (NSDUH)’s categorization of older drug users as those age 26 and older for some variables to the standard US retirement age of 65 years and over.<sup>15,23</sup> For the purposes of this review, we focused primarily on cocaine use in adults ≥65 years of age, but included the younger members of the “baby

boomer” generational cohort as well (those ages >59 years in 2023).

## METHODS

We performed a literature review of PubMed and Web of Science databases, supplemented by Google Scholar using combinations of “cocaine,” “elderly,” and “older adults.” Search results were imported from the online databases into EndNote citation management software (Clarivate, Philadelphia). After deletion of duplicates, 170 articles (primarily original research and reviews) were reviewed for this paper. We produced an annotated bibliography containing title and author information for each paper along with its abstract to select the papers to include; each author reviewed this bibliography to determine if articles were relevant, and if so, in which section(s) the material should be included. We searched the reference sections of particularly salient articles and utilized PubMed’s and Google Scholar’s “Cited By” and “Similar Articles” functions for those articles to find additional materials to include. A total of 66 references have been included in this review.

## RESULTS

### EPIDEMIOLOGY OF COCAINE USE AMONG OLDER ADULTS

Overall, SUD is more prevalent in men, but misuse of prescription drugs is higher in women.<sup>24</sup> Some other most commonly misused substances are alcohol, prescription drugs such as opiates and benzodiazepines, and over-the-counter (OTC) medications. Drugs that are most commonly reported as misused are non-medical opioids, cocaine, and methamphetamine, and cannabis use among midlife and older adults has been increasing recently, both in the community and in drug treatment centers.<sup>2,3,14, 25-27</sup>

According to the National Household Survey on Drug Abuse (NHSDA), cocaine use continues to be a significant problem in the United States.<sup>28</sup> The 2021 survey found that among adults aged 65 and older, 11.3% had ever ingested cocaine, 0.4% had done so in the last year, and 0.2% had done so in the last 30 days; these figures were significantly higher among adults ages 60-64 (25.3% had ever used cocaine, 0.6% in the last year, and 0.2% in the last 30 days) and 55-59 years (23% ever used cocaine, 1.1% used in the last year, and 0.8% in the last 30 days). Taken together, an estimated 308,000 Americans 55 years of age and older had used cocaine in the previous month.<sup>28</sup>

Cocaine use in elder populations is not well detailed in the literature; most existing research consists of case reports and literature reviews noting the paucity of data,

rather than original research.<sup>29,30</sup> Cocaine is a frequent cause of unintentional overdose deaths; Han et al. found that cocaine was associated with 46% of overdose deaths among middle aged and older adults in New York City in 2016, and Choi et al. found that numbers of reports of cocaine overdoses to poison control centers is growing.<sup>31,32</sup> Data used to analyze two distinct periods in cocaine-involved overdoses showed stable rates of cocaine-involved overdoses between 2010 to 2014; however, from 2015 to 2016, the rate of cocaine-involved overdoses doubled from 5.2 to 10.4 per 100,000 residents.<sup>33</sup> This corresponds to the rise in prevalence of fentanyl as an additive to other opiates, and may in fact be related, as substances distributed as powder cocaine may be adulterated with fentanyl.

### Risk Factors

A number of risk factors for SUD among older adults have been noted in the literature; most are similar to those for younger adults (chronic pain syndromes, poorer overall health), but some seem unique to older adults (primarily social isolation).<sup>24</sup> Though very few have been found specifically for cocaine in this population, there appears to be a robust association of use of other substances (notably alcohol and cannabis) with cocaine use among older adults.<sup>34</sup>

### EFFECTS OF COCAINE USE ON THE ELDERLY POPULATION

Along with biological age-related changes that impact wellness, behavioral risk factors can have a significant impact on healthy aging; such risk factors likely explain the paradoxically high level of morbidity observed among “baby boomers,” even as they live longer than previous cohorts.<sup>5,15,35</sup> There is increasing recognition that drug use accelerates age-related pathophysiological processes, including inflammation, cellular aging and declines in brain volume and cognitive functioning.<sup>36-38</sup> Though there has been limited research to inform clinical care for older adults who use cocaine, negative physical and psychosocial impacts have been noted in the literature.

#### Physical/Physiological Effects

SUD in general can have disparately negative effect among older adults due to the higher frequency of comorbidities associated with aging: diabetes, cardiovascular disease, kidney diseases, and even malignancies.<sup>1,39</sup> Older persons with a drug dependence have higher rates of medical morbidities such as hypertension, liver disease, bodily pain, and physical functioning than younger drug-dependent patients or when compared to older-aged population norms.<sup>1,39</sup> They were also found to have a relative acceleration of these associated comorbidities, as well as

elevated risk of neurotoxicity and drug-related adverse consequences.<sup>39</sup> Injection drug use (including of cocaine) is associated with an increased likelihood of falls.<sup>40</sup> These factors together may account for the greater age-related declines in functioning observed in older adults with SUD compared to younger adults.<sup>14</sup>

A 2000 survival analysis by Neumark et al. found that SUD increased age-adjusted mortality; individuals with SUD died an average of 22.5 years earlier than those without SUD.<sup>41</sup> SUD in older people has been associated with an increased risk of neurotoxicity and drug-related adverse events, likely related to age-related changes in brain metabolism and pharmacokinetics.<sup>42</sup> Substances of abuse can cross-react and amplify side effects of medications being used for the treatment of other conditions.<sup>1,43</sup>

There are relatively few studies demonstrating the specific adverse risks of cocaine use in the elderly, but given that cocaine is known to increase the frequency of cerebrovascular accidents, the cognitive impairments associated with cocaine, and the increased risk of cerebral and cardiovascular events in this age group, this remains an area that warrants further exploration due to increasing trends.<sup>44,45</sup> Some of the conditions associated with cocaine use that have been noted across the board include ischemic heart disease, left ventricle hypertrophy, vasospasms, cardiac arrhythmias, and cerebrovascular, as well as aortic, arteriosclerosis.<sup>30</sup> The effects of cocaine have also been noted in the lungs of users of all ages as well as gastrointestinal and bleeding dysfunctions. Psychiatric dysfunctions have also been reported in literature.<sup>30</sup> In one single-center study, Rivers et al. found that cocaine use was associated with cardiac, pulmonary, cerebrovascular, psychiatric, and gastrointestinal complications.<sup>30</sup>

#### Psychological and Social Effects

Cocaine use has been shown to cause toxic effects on the brain in the prefrontal cortex,<sup>46,47</sup> and there is likely an interplay between cocaine use and aging that compromises neuropsychological integrity among users.<sup>46-49</sup> Among all age groups, cocaine use has been associated with deficits in key functions for social cognition and relationships, such as executive functioning and impulse control.<sup>46,50</sup> Given higher rates of social isolation among older adults and the association of isolation with negative health outcomes, any factors causing such impairment are likely to have negative impacts.<sup>24,51</sup> Adults who use drugs including cocaine may face additional isolation from disconnections from friends and family and stigmatization of their drug use both socially and by organizations offering social supports.<sup>14</sup>

## CHALLENGES FACED WITH DIAGNOSIS AND TREATMENT OF COCAINE USE DISORDER IN THE ELDERLY

Overall, SUD (apart from alcohol use disorder) is underdiagnosed among individuals over 65 years of age, and this is likely to be especially true for cocaine, given the relatively lower frequency of its use relative to alcohol and prescription medication misuse.<sup>15</sup> Diagnosis may be difficult because symptoms of cocaine use, like other stimulants, increase the risk of cardiovascular events such as ischemic strokes or myocardial infarction, hypertension and arrhythmias.<sup>30,39</sup> These are medical conditions that are already more frequent in the elderly population. When elderly people present with complications of cocaine use that may have resulted from vasospasms due to cocaine use, these symptoms are usually attributed to some other known baseline disease that they already have been diagnosed with such as cardiovascular and neurologic disorders.<sup>16</sup> Memory can be severely impaired in patients using cocaine, and if these patients are elderly adults—especially adults who have been diagnosed with dementia—the symptoms may immediately be attributed to their baseline clinical condition.<sup>52</sup>

These challenges with the diagnosis of cocaine in the elderly are attributable to inadequate research as well as the assumption that any presenting symptoms are due to pre-existing medical conditions (particularly in the hospital setting, where providers are less likely to be familiar with an individual’s behavioral habits than a primary care provider), relatively short healthcare provider visits that do not allow enough time for deeper exploration of the patient’s problems, low index of suspicion by the clinician, and the fact that denial is not uncommon by both the elderly and their caretakers.<sup>13,21,53</sup>

Detection of cocaine use from physical samples is possible but is not uniformly available, and sensitivity varies markedly by sample modality and location. The presence of cocaine can be tested for both in the urine and in serum. In urine, the metabolite benzoylecgonine can readily be detected with few concerns for false positives or negatives. Benzoylecgonine generally remains secreted in urine for up to 72 hours, which is far beyond the 6 to 12 hours when patients exhibit most significant clinical symptoms.<sup>54</sup> However, urine specimens may be too dilute to identify low levels of cocaine.<sup>55</sup>

Cocaine can also be tested via blood, where metabolites remain for up to 90 days. Cocaine traces in oral fluid last from 1 to 36 hours and in sweat from 7 to 14 days. While tests using hair are available, the testing results may be biased according to hair color: some drugs have enhanced binding to melanin, so dark hair tends to contain relatively more of some basic drugs like cocaine, methamphetamine, and opioids than lighter hair.<sup>55</sup> For treatment of emergent issues such as overdose, such testing may

be useful; however, more evidence is needed for effective treatment approaches for cocaine SUD in older adults and the testing of adults over 65 years for cocaine use.

Many providers assume that cocaine use, like most illicit drug use, is the province of the young, and is likely to have started before the age of 30; this may result in lack of screening for cocaine use in the elderly even when they have concerning symptoms. Failure to screen has been associated with missed diagnosis in these individuals in the literature.<sup>1,56</sup> Chait et al. completed a study on veterans who were  $\geq 50$  years of age and found that up to 14.5% of the veterans being treated for crack cocaine use had their first use after 50 years of age.<sup>21</sup>

Other factors responsible for the lack of attention to SUD include the current older cohort’s disapproval of and shame about use and misuse of substances, along with a reluctance to seek professional help for what many in this age group consider a private matter.<sup>57</sup>

## TREATMENTS

Treatment of cocaine use disorder is highly challenging, there is no standard treatment regimen, and effect sizes of treatments are modest at best.<sup>58</sup> We found no literature specific to treatment among older adults; overall, the evidence for effective treatments for any age group is equivocal. Elderly patients with SUD have a lower probability of receiving treatment for SUD.<sup>59</sup> In a recent study using NSDUH data, Parish et al. estimated that 1.7 million Medicare recipients had documented past-year substance abuse disorder, but only 11% had received treatment.<sup>60</sup> One recent meta-analysis found that among pharmaceutical, psychosocial, and complementary treatment approaches, only contingency management—where individuals receive positive reinforcement in the form of rewards, such as cash, for desirable behaviors, such as not using a substance and subsequently testing negative for consumption—was associated with a sustained reduction in urine test positivity for cocaine use.<sup>58,61</sup> Psychosocial approaches to cocaine use disorder, primarily contingency management and cognitive behavioral therapies, are the main modality for treatment in the United States,<sup>62</sup> but the effect sizes of most therapies is small and none are effective for all (or even most) patients.<sup>62-64</sup> As of 2023, there are no medications for cocaine use disorder that have been approved by the US Food and Drug Administration (FDA); though a number of pharmacological agents are under investigation, none have been conclusively demonstrated to be more effective than placebo in well controlled trials of sufficient sample size to pass FDA criteria. Approaches combining pharmaceutical (e.g., prescription psychostimulants) and psychosocial treatments are under study, but none have yet been proven superior to others.<sup>62,65,66</sup>

## CONCLUSIONS

This review highlights the complex, often overlooked, and growing of cocaine use among the elderly population. As the number of older individuals admitted for SUD continues to climb, we must adapt by increasing screening, early detection, and treatment options for older persons.<sup>1</sup>

Because of the rapidly aging demographic and changing societal dynamics with regards to substance use, especially cocaine use disorder, it is crucial to recognize the unique challenges faced by older individuals struggling with this addiction. Despite the extent and complex nature of this problem, the literature is sparse, highlighting the need for more research not only on the prevalence of cocaine use, but also on possible solutions. Cocaine use disorder affects the elderly in more serious ways because of the increased vulnerability of their aging bodies to the physiological and cognitive effects of cocaine. Additionally, elderly people tend to have multiple medical comorbidities, exposing them to interactions of cocaine with commonly prescribed medications.

### Areas for Further Study

The implications of this review extend beyond managing the health of an individual. Tailored prevention strategies, comprehensive assessment, and age-specific interventions to address the distinct needs of elderly cocaine users are important and necessary. By encouraging efforts to achieve a greater understanding of this fast-growing problem and promoting further research, we can prioritize the well-being and quality of life of our aging population by offering support and effective solutions for those struggling with cocaine use in their later years.

There are several major unknowns about the extent of use and effects of cocaine among older adults; despite reports of increased prevalence, the epidemiology of use has not been fully characterized. We need evidence-based literature to better describe the trends and patterns in growth and the magnitude of cocaine’s effects. Additionally, research is needed to fully capture the effects of cocaine on the elderly given physiological changes associated with aging and the potential effects of cocaine on comorbid conditions common among older adults, as well as descriptions of interactions with the medications they may be taking for other comorbid conditions.

Such studies will require ascertainment of cocaine users, particularly those who are at high risk of SUD. Diagnosing adults of any age with SUD is challenging, but among older adults, providers may be especially likely to attribute symptoms to other clinical conditions. There is no definitive approach for testing and screening for SUD, especially among the elderly.

Evidence on the treatment of cocaine use disorder in the elderly is not yet available, and evidence for treatment

of SUD in general among this cohort is sparse. We need studies to identify the areas where intervention can have the greatest impact to improve health outcomes. One example might be research on how to change the norms and misconceptions that cause elderly people to feel uncomfortable seeking help, accepting care, or even admitting that SUD is a problem that they are dealing with. It is important to conduct more research and pay closer attention to social determinants of health that influence the use of substances such as cocaine for promising future directions in the care of adults with SUD. We need evidence on specific treatment programs tailored towards the needs of elderly patients with cocaine use disorder. Their needs may be completely different from those of younger individuals. Finally, it is important to develop strategies to help in normalizing the diagnosis and care for elderly patients with cocaine use disorder so that this clinical condition is not seen and treated as a taboo.

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The authors have no conflicts to declare.

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### Author Contributions

All authors have reviewed the final manuscript prior to submission. All the authors have contributed significantly to the manuscript, per the International Committee of Medical Journal Editors criteria of authorship.

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or revising it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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