

# Oral health in intravenous drug addicts and the role of dental professionals

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## Abstract

**Background:** The global rise in opioid addiction, particularly through intravenous methods, presents significant health challenges, notably in oral health. As opioid-related disorders continue to grow, their impact extends beyond systemic health, severely affecting oral health. The toxic nature of these substances, compounded by poor oral hygiene and weakened immunity, leads to a range of oral health issues including periodontal disease, osteomyelitis, osteonecrosis, and an increased risk of oral cancers. Addressing these challenges is critical not only for the physical health of affected individuals but also for their social and psychological well-being.

**Aim:** This study aims to synthesize the existing literature on the oral health impacts of intravenous drug use, with a particular focus on the role of dental professionals in early detection, management, and the integration of oral health care into addiction recovery programs.

**Methods:** An extensive literature search was conducted using PubMed and Web of Science, focusing on peer-reviewed articles published in English between 2005 and 2024. The search utilized keywords such as 'drug-induced oral complications,' 'periodontal disease,' 'osteomyelitis,' and 'oral cancer.' Studies that specifically addressed the impact of intravenous drug use on oral health were selected, while non-peer-reviewed, non-English, and irrelevant studies were excluded. The findings were systematically reviewed to offer a comprehensive overview of the oral health implications associated with intravenous drug use.

**Results:** The review reveals that intravenous drug users are at a heightened risk for rapid progression of periodontal disease, increased incidence of dental caries, and frequent oral infections, including abscesses and systemic complications. Additionally, these individuals are more susceptible to developing oral cancers, osteomyelitis, and osteonecrosis, conditions that are challenging to treat and often have poor outcomes. The psychological and social consequences of poor oral health further exacerbate the risk of relapse, as individuals may turn to substances to manage pain or cope with the stigma associated with their condition. The role of dental professionals is critical in early detection and prevention, highlighting the importance of integrating oral health care into broader addiction treatment programs.

**Conclusions:** This review underscores the vital role dental professionals play in managing the oral health of intravenous drug users. Early detection and timely intervention are essential in preventing severe oral health complications and supporting long-term recovery. Integrating oral health care into addiction treatment programs is crucial for improving patient outcomes, reducing relapse rates, and providing comprehensive rehabilitation for this vulnerable population. (TCM-GMJ December 2024; 9 (2): P50-P54)

**Keywords:** Toxic Osteomyelitis, Illicit drugs, oral health, dental care and drug addiction

## Introduction

The latest global trends indicate that opioid drug addiction, particularly through intravenous use, is on the rise. According to the World

Drug Report 2024, drug use disorders, including those related to opioids, have continued to expand globally.

Recent studies highlight the escalating opioid crisis in the United States, with projections indicating a significant increase in overdose deaths. Nearly 82,000 annual opioid overdose deaths by 2025, totaling approximately 700,000 deaths from 2016 to 2025 (1).

Intravenous drug users face numerous health risks, primarily associated with drug toxicity, administration route, and social implications of addiction (2). Common complications include blood-borne diseases, infections, abscesses, and collapsed veins (3). With all this, we must not for-

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get the harmful effects and risks of intravenous drugs on oral health.

Opioids are known for their potent toxic effects, which can lead to severe complications affecting both internal organs and the skeletal system. Their impact on oral health is particularly significant, often resulting in serious consequences such as tooth loss and even the deterioration of facial bones. These physical and functional disorders are accompanied by considerable psychological distress. Given the severity of these issues, addressing the opioid crisis is not only a medical imperative but also a matter of social urgency.

Our aim is to provide a comprehensive overview of the oral health consequences associated with intravenous drug use.

### Methods

Data were collected using PubMed and Web of Science, focusing on articles published in English between 2005 and 2024. The search utilized the following keywords: 'drug induced oral complications,' 'periodontal disease,' 'osteomyelitis,' and 'oral cancer.' Inclusion criteria centered on studies that specifically addressed the impact of intravenous drug use on oral health. Non-peer-reviewed articles, non-English articles, and those unrelated to the topic were excluded.

### Results and discussion

This review reveals that intravenous drug users (IDUs) face significant oral health challenges, including rapid progression of periodontal disease, high rates of dental caries, and severe conditions such as osteomyelitis and osteonecrosis. We reviewed 29 articles, the total number of patients included in the literature reviewed is 2,332. Key topics discussed in this review include Oral Health Complications and Risks Associated with Intravenous Drug Use, Barriers to Dental Care and the Impact on Oral Health in Drug Users, and Integrated Healthcare and Dental Services. These complications are exacerbated by barriers to dental care, including stigma, socioeconomic challenges, and emergency-driven visits. Integrating dental care into addiction treatment programs, providing oral hygiene education, and addressing nutritional habits are effective strategies to improve outcomes. The findings highlight the critical role of dental professionals in mitigating oral health disparities among IDUs and supporting their overall recovery.

In this section we explore the multifaceted relationship between intravenous drug use and oral health. This includes examining the range of oral health complications and associated risks, identifying the barriers that prevent drug users from accessing adequate dental care and the subsequent impact on their oral health, and discussing the role of integrated healthcare approaches in providing comprehensive dental services to this population

#### Oral Health Complications and Risks Associated with Intravenous Drug Use

Intravenous drug addiction has far-reaching effects, particularly on oral health, resulting in a significant decline in overall dental health among affected individuals. A primary consequence is the rapid progression of periodontal

disease. This condition, is one of the most significant consequences of Intravenous drug use (IDU). As the disease progresses, it weakens the supporting structures of the teeth, leading to mobility and eventual tooth loss. The reduction in salivary flow, combined with neglect of oral hygiene, worsens the condition, increasing the risk of gum disease and related complications (4,5). Furthermore, infections like osteomyelitis are common in intravenous drug users, leading to further damage to the jawbone and soft tissues. This condition can result in rapid degradation of the jawbone, causing structural collapse and significant oral health deterioration (6).

Dental neglect during active drug use plays a significant role in the progression of oral health issues, with many patients presenting advanced periodontal disease and severe decay upon entering rehabilitation (7). Research shows that drug users have a significantly higher Decayed, Missing, and Filled Teeth (DMFT) score than non-users, indicating a higher prevalence of dental caries. One study found an average DMFT score of 3.48 among drug users, with most being decayed teeth, highlighting the need for dental treatment. This higher rate of dental caries is linked to poor oral hygiene and lifestyle factors associated with drug use (8). Additionally, drug addicts exhibit higher rates of enamel erosion, secondary adentia, and pathological abrasion than non-users. The parafunction index of masticatory muscles is more than twice as high in addicts, indicating a severe impact on the dental system. Histological examinations reveal compromised mineralization in both enamel and dentin, especially in individuals under 25, suggesting drug use significantly weakens teeth and emphasizing the need for targeted dental care strategies (9).

The relationship between IDU and jawbone degradation is also critical. As periodontal disease advances, the bone supporting the teeth becomes compromised, leading to irreversible damage. In extreme cases, such as with phosphorus-based drugs, there is extensive maxillofacial bone destruction, which requires surgical intervention to prevent further deterioration (10). IDU thus not only contributes to gum disease and tooth loss but also accelerates bone degradation, creating significant oral health challenges that require comprehensive treatment and addiction management (11).

Osteomyelitis of the jaws is a severe oral health complication associated with IDU. It is a serious bone infection that can lead to significant morbidity if untreated, arising from poor oral hygiene and the direct effects of drug use, which impair immune response and tissue health. Drug users are more vulnerable due to vascular damage from injections and neglect of dental care. IDU contributes to osteomyelitis by reducing blood flow and increasing bacterial load. Drugs like methamphetamine, heroin, and phosphorus-based substances weaken the immune system and disrupt healing, increasing susceptibility to bone infections. Sood Ramita and colleagues (12) highlight how these substances reduce the body's infection-fighting ability, accelerating severe bone infections. The compromised vascular supply and frequent untreated abscesses provide a path for bacterial infection (13).

Osteomyelitis typically presents with necrotic lesions and severe pain, often requiring aggressive surgical intervention, including bone removal. The infection is often recurrent, especially in those continuing substance abuse, making management challenging. Fitkalo et al. and colleagues (6) noted that toxic jawbone osteomyelitis cases require extensive necrotic tissue resection followed by long-term antibiotic therapy. Unfortunately, drug users face higher risks of complications due to delayed recovery and poor compliance with treatment, exacerbating their condition (14).

In addition to osteomyelitis, intravenous drug users are at a heightened risk of developing osteonecrosis. Osteonecrosis is characterized by the death of bone tissue due to insufficient blood supply. This condition is highly prevalent among intravenous drug users, particularly those abusing drugs like methamphetamine and desomorphine (commonly known as "Krokodil"), which severely compromise vascular integrity and reduce the bone's ability to repair itself (14). The repetitive injections, combined with poor oral hygiene, create a pathway for bacteria to enter the jawbone, leading to severe infections that result in bone necrosis. Osteonecrosis frequently develops in the maxilla and mandible among drug users due to the fragile state of oral tissues and high bacterial load. The jawbone becomes prone to necrosis because of poor circulation and chronic infections, exacerbated by continued intravenous drug use. Once it sets in, osteonecrosis requires aggressive treatment, including surgical debridement and long-term antibiotics, to prevent further bone deterioration (10).

Additionally, drug users face a heightened risk of developing oral cancer and precancerous lesions. Intravenous drug use (IDU) has a well-documented link to oral cancers and conditions like leukoplakia. These users are more susceptible to oral lesions that can progress to cancer due to chronic irritation, poor hygiene, and the direct effects of drugs like heroin, cocaine, and methamphetamine on oral tissues (8,15).

Beyond these conditions, drug users often experience a higher prevalence of musculoskeletal disorders, especially in the temporomandibular joint (TMJ). They're at a significantly increased risk of developing TMDs due to behaviors like bruxism and jaw clenching, common side effects of psychoactive drug use. These behaviors, combined with poor nutrition and the overall impact of drug use, contribute to musculoskeletal disorders (16).

Moreover, opioid use, particularly chronic misuse, severely impacts the salivary glands, often resulting in **xerostomia** or dry mouth. This reduction in salivary flow compromises the oral cavity's ability to neutralize acids, clear debris, and remineralize teeth, significantly increasing the risk of dental decay and gum disease. The condition is exacerbated among opioid users due to their neglect of oral hygiene and poor nutritional habits, which further contribute to the onset of periodontal disease and dental caries (4,17). The link between opioid use, xerostomia, and relapse is especially critical when considering self-treatment

behaviors in opioid users. Individuals may use opioids to manage dental pain caused by oral health problems rather than seeking professional care, which often leads to a dangerous cycle of drug dependence and relapse. For example, many opioid users experience toothache due to untreated decay or infections and may turn to opioids to alleviate the pain temporarily. However, this practice increases the likelihood of addiction relapse, as the drug use fails to address the underlying cause of the dental issue (18).

### **Barriers to Dental Care and the Impact on Oral Health in Drug Users**

We also need to address the fact, that opioid users tend to visit the dentist only in emergencies, often delaying treatment until the problem becomes severe, such as when infections have advanced to abscesses or when osteonecrosis sets in due to untreated infections and compromised blood flow to the jawbone (5). The compounding effects of drug use on oral health, especially in the context of xerostomia and untreated dental issues, create a vicious cycle that perpetuates both oral health decline and substance abuse disorders. Dental phobia, anxiety, and stigma are significant barriers that prevent drug users from seeking dental care. Many develop a deep-seated fear of dental procedures due to past negative experiences or fear of pain. This fear, combined with the stigma of drug use, often leads individuals to avoid dental clinics, where they feel judged by healthcare professionals. As a result, their oral health conditions worsen, leading to emergency-level issues like abscesses and severe decay that could have been managed with regular checkups (19).

Access to dental care for drug users is also limited by socioeconomic challenges, such as poverty, homelessness, and lack of insurance, which restricts their ability to obtain preventive care. Many rely on emergency services for severe conditions, further deepening oral health disparities in this population (20). Additionally, the chaotic lifestyle of drug users often makes it difficult for them to maintain self-care practices, resulting in higher rates of dental caries and periodontal disease (17).

Poor oral health has substantial social and psychological consequences. Conditions like tooth decay, missing teeth, and gum disease lead to social isolation, low self-esteem, and reduced social interactions. These factors can push drug users into depression, further perpetuating cycles of addiction (20). Poor nutrition among drug users also exacerbates oral health issues. Diets high in sugar and acidic foods accelerate the development of dental caries and gum disease. Combined with drug-induced xerostomia, this poor nutrition creates a hostile environment for oral health, contributing to conditions such as osteonecrosis of the jaw (21).

### **Integrated Healthcare and Dental Services**

Incorporating dental care within substance abuse treatment programs is vital for improving oral health among drug users. Routine dental checkups in rehabilitation centers, like methadone clinics, enhance accessibility and encourage early intervention. Studies show that integrating dental services with addiction treatment addresses both

oral and overall health challenges in IDUs (22–24).

Education on oral hygiene is crucial for reducing dental diseases in drug users, as many neglect self-care due to their chaotic lifestyles. Drug use exacerbates the condition by causing xerostomia, leading to tooth decay. Teaching proper brushing, flossing, and fluoride use can lower the risk of dental caries and gum disease (25,26). Concerning xerostomia, using saliva substitutes or mouth moisturizers is essential to combat dry mouth. Regular fluoride treatments can protect against decay, particularly for those struggling with regular oral hygiene (27). As we know, dental phobia often prevents drug users from seeking dental care. Interventions like cognitive-behavioral therapy (CBT) can reduce dental anxiety, encouraging regular treatment and preventing complications like infections and tooth loss (28,29).

In terms of nutritional counseling, poor dietary choices among drug users exacerbate oral health problems. Consuming diets high in sugar and acids accelerates dental caries and gum disease. Nutritional counseling can promote healthier food choices, positively impacting oral and overall health (15,30).

Oral health issues often go untreated in those with substance use disorders due to stigma, dental anxiety, and limited access to care. Integrating dental services into addiction programs can break this cycle, as drug users typically seek care only in emergencies, leading to severe outcomes like tooth loss and osteomyelitis. Preventive care through regular check-ups can help detect issues early and prevent such complications (22).

Addressing stigma in healthcare settings is crucial. Training healthcare workers to offer non-judgmental care encourages drug users to seek early intervention. Providing free or low-cost dental services can help overcome financial barriers (31,32).

The role of dental professionals is of great importance as they can detect early signs of drug abuse through oral assessments, identifying issues like dental caries, xerostomia, and mucosal lesions. Early intervention can prevent severe complications such as osteomyelitis and tooth loss (22,23). Regular dental visits can serve as a gateway to broader health interventions, allowing education on oral hygiene, use of saliva substitutes, and timely infection care. Preventive measures like fluoride treatments and routine cleanings can help reduce the severity of oral health problems and avoid more invasive treatments. Early detection allows for referral to addiction treatment programs, aiding recovery and mitigating both oral health deterioration and drug dependency (15,31).

## Conclusion

This review emphasizes the significant oral health challenges faced by intravenous drug users, including the rapid progression of periodontal disease, increased risk of oral infections, and severe conditions such as osteomyelitis, osteonecrosis, and oral cancers. Dental professionals play a critical role in mitigating these issues through early detection, timely intervention, and the integration of oral health care into addiction treatment programs. Addressing the

oral health needs of intravenous drug users is not only a medical necessity but also a crucial component of comprehensive addiction recovery. By adopting a holistic approach that includes both dental care and addiction treatment, we can improve patient outcomes, reduce relapse rates, and enhance the overall quality of life for this vulnerable population.

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