

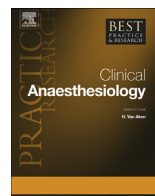


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Perioperative analgesia and challenges in the drug-addicted and drug-dependent patient



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The epidemic use of illicit drugs has led to an increasing number of patients with drug addiction and dependence presenting for perioperative care. There are a wide variety of drugs commonly abused including opioids, such as heroin and prescription drugs; stimulants, such as amphetamine and cocaine; depressant drugs, such as alprazolam and diazepam; and hallucinogens, such as lysergic acid diethylamide, phencyclidine, and marijuana. Treatment of opioid dependence by office-based buprenorphine and methadone maintenance programs has expanded opportunities for therapy. Treatment of these patients in the perioperative period is challenging. In addition to pain control, management of anxiety, psychological states, and hemodynamic control are the factors to be considered to provide optimum treatment. Although opioids are the mainstay for the control of acute pain, other therapeutic options include alternative routes of administration of local anesthetic, ketamine infusion, and the use of regional anesthesia.

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We discuss optimum perioperative management, the role of perioperative urine testing, and special considerations in patients on methadone and buprenorphine.

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Introduction

The main dangers of a drug addiction during the perioperative period are drug overdose and withdrawal [1,2]. It is thus important for the anesthesiologist to understand which substances are commonly abused and the frequency of their preoperative use. Additionally, appreciation of the pharmacodynamics and pharmacokinetics as well as drug interactions are critical to ensure perioperative safety of drug-dependent and drug-tolerant patients.

Illicit drugs

Cocaine

Cocaine is a natural alkaloid extracted from the leaves of the shrub *Erythroxylon coca* which is an indigenous plant in South America, Mexico, the West Indies, and Indonesia. Over the past 20 years, the abuse of cocaine has grown enormously because of the ease of availability and dramatic reduction in cost. The alkaloid is dissolved to form a water-soluble salt cocaine hydrochloride. The bioavailability of cocaine is 30–40% by the oral route and about 80–90% by inhalation or via the intranasal route. Cocaine inhibits the presynaptic uptake of neurotransmitters, such as dopamine, serotonin, epinephrine, and norepinephrine, leading to their increased availability to act on the adrenergic receptors and the stimulation of respiratory, cardiovascular, renal, and central nervous systems. Excessive stimulation of these systems with cocaine can lead to profound respiratory depressions, seizures, severe vasoconstriction stroke, myocardial infarctions, cardiac arrhythmias, ventricular fibrillation, and sudden death. Cocaine also has a local anesthetic effect and can block sodium receptors causing prolonged QRS, and can produce negative inotropic and chronotropic effects. Trauma patients requiring surgery are particularly likely to be recent users of cocaine, with one study finding that 38% of casualty victims had tested positive for cocaine in serum or urine. [3] Cocaine intoxication is the number one cause of drug-related death, which is usually cardiopulmonary related [4,5].

Amphetamines

Amphetamines and related drugs cause the release of sympathetically active substances such as serotonin, dopamine, and norepinephrine. This leads to common changes in personality, aggression, and euphoria. Its half-life is about eight times that of cocaine. MDMA or 3,4-methylenedi oxymethamphetamine is the most common amphetamine to be abused; however, there are many derivatives, many of which can be obtained legally through a prescription for a variety of behavioral states. Toxic ingestion of MDMA can lead to profuse sweating, tachycardia, rhabdomyolysis, and other serious side effects, including malignant hyperthermia, disseminated intravascular coagulation, hepatorenal failure, strokes, and seizures.

Hallucinogens

The most common drugs in the class of hallucinogens are phencyclidine (PCP) and lysergic acid diethylamide (LSD). PCP produces a dissociative state with associated agitation, delirium, and hallucinations. Its mechanism of action includes agonist, partial agonist, and antagonist at dopaminergic,

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