"Dealing" with Designer Street Drugs

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Designer drugs refer to newly synthesized fentanyl, meperidine, amphetamine or other street drug derivatives that are legal because they have not yet been classified as controlled substances (Table 1). A more liberal definition refers to designer drugs as "party or rave drugs," which include 3,4-methylenedioxymethamphetamine (MDMA or ecstasy), gamma-hydroxybutyrate (GHB) and ketamine. This definition also includes substances, such as 2C-B amphetamines (*i.e.*, Eve) and tryptamines (*i.e.*, Foxy and alpha-methyl-tryptamine).

Raves are large dance parties held in venues that are meant to be alcohol free. Access to water, washrooms and adequate ventilation may be limited, often causing conditions of excessive environmental heat. Rave-goers often abuse substances for their stimulant, euphoric or hallucinogenic effects.

Cyclic enjoyment of these substances often occurs, as evidenced by some of the large patterns-of-use studies published by public health associations and other organizations. Seizures of abused substances, reports of adverse reactions to substances and other factors temporarily influence these patterns. It must also be remembered that marijuana, cocaine and heroin still remain popular drugs.

MDMA is the prototypal amphetamine available in the urban community. Table 2 provides a list of common street names for designer street drugs. Ecstasy is available as tablets with variable concentrations of MDMA per tablet with an average of 50 mg to 150 mg. There is no quality assurance for drugs on the street, so it is possible that there are other psychologically active

The ketamine dose needed to achieve the "K-hole" is dangerously close to that which induces respiratory depression.

Table 1

Scheduled drugs in Canada

(Adapted from the Controlled Drug and Substances Act, 1996)

Schedule I substances	Amphetamines, opium and derivatives and analogues, cocaine and derivatives, PCP and fentanyl derivatives, unless specifically excluded in the Act.
Schedule II substances	Cannabis, its preparations, derivatives and synthetic preparations, unless specifically exluded.
Schedule III substances	Methylphenidate, methaqualone, LSD (and similar tryptamines), psilocybin, mescaline, flunitrazepam, GHB and cathinone.
Schedule IV substances	Barbiturates, their salts and derivatives, glutethimide, ethchlorvynol, meprobamate, benzodiazepines and anabolic steroids.
Schedule V substances	Propylhexedrine
Schedule VI substances	Several substances that would be precursors to other scheduled substances or would be chemicals used in the manufacturing of other scheduled substances.
Schedule VII/VIII substances	Specific amounts of cannabis and cannabis resin only.

PCP: Phencyclidine
LSD: Lysergic acid diethylamide
GHB: Gamma-hydroxybutyrate

agents substituted for or added to the MDMA, as well as excipients. Manifestations of toxicity may be from any of these substances, in addition to the route of exposure.

Amphetamines may act by enhancing dopamine, norepinephrine and serotonin outflow. The usual presentation of toxicity is of the sympathomimetic toxidrome (Table 3) but, in its severe form, the presentation may mimic the serotonin syndrome. Complications of this toxicity could include rhabdomyolysis, renal failure, disseminated intravascular coagulation and death. Aggressive supportive care is the mainstay of treatment. Hyperpyrexia is predictive of death; aggressive cooling measures are most important to prognosis.

GHB is a clear liquid with a slightly salty taste in its pure form. Other substances, such as gamma-butyrolactone (GBL), a solvent, 1,4-butanediol and gamma-valerolactone (GVL) are sold as natural sleep supplements, are precursors to GHB and are metabolized to GHB *in vivo*.

Table 2

Common street names for designer drugs

Category	*Chemical*	*Street name*
Amphetamines	2C-B MDMA Methamphetamine PMA	Eve Ecstasy, X, XTC, Vitamin E Crystal, crank, ice, meth, speed Death
GHB		G, Grevious bodily harm, liquid E, liquid X
Ketamine		Special K, “K”, kay, Vitamin K
Tryptamines	Alpha-methyl-tryptamine 5-methoxy-diisopropyl-tryptamine	AMT Foxy, Foxy-methoxy

2C-B: 4-bromo-2,5-dimethoxyphenethylamine
MDMA: 3,4-methylenedioxymethamphetamine
PMA: Paramethoxyamphetamine
GHB: Gamma-hydroxybutyrate

GHB is an endogenous substance and a precursor that binds to gamma-aminobutyric acid type B receptors, the main central inhibitory neurotransmitter. At low doses, GHB is an amnestic. As doses increase, the effect is of euphoria. Doses greater than 50 mg/kg would cause unconsciousness with bradypnea with otherwise normal vitals. Careful attention to the airway and ventilatory status will support these patients until the GHB is metabolized. These patients have no long-term sequelae unless there has been prolonged respiratory depression, ischemic neurologic damage and/or aspiration.

Sudden cessation of GHB use by a dependent individual can cause severe withdrawal syndrome that mimics alcohol withdrawal. Withdrawal onset is rapid (as GHB is a short-acting substance) and often prolonged, requiring benzodiazepine and sometimes, barbituate sedation at high doses for many days.

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Ketamine is an anaesthetic used in doses of 2 mg/kg intravenously in children, severe asthmatics and in veterinary medicine. It is a popular drug for its dissociative properties. Its action is similar to phencyclidine, but its duration of action is shorter. Some ravers strive for the "K-hole," where one feels detached from their environment and looking in. The dose needed to achieve this state is dangerously close to that which induces respiratory depression. Symptoms of ketamine overdose are of mild sympathomimetic stimulation with respiratory depression. Emergence from ketamine anaesthetic and abuse states can produce an undesirable delirium with a disturbing psychosis.

Finally, the newer substances, 2C-B (4-bromo-2,5-dimethoxyphenethylamine), and Foxy (5-methoxy-diiso-

Table 3

Common toxidromes and associated symptoms

Toxidrome	*Associated Symptoms*
Sympathomimetic	Diaphoresis, mydriasis, tachycardia, hypertension, hyperpyrexia, irritability, seizures
Alcohol or sedative-hypnotic withdrawal	Diaphoresis, mydriasis, tachycardia, hypertension, hyperpyrexia, tremors, seizures, hallucinations
Serotonin syndrome	In the setting of use/abuse of serotonergic agent(s): Mental status changes include: - Irritability, agitation, disorientation, seizures, hallucinations, insomnia, drowsiness, lethargy, coma Neuromuscular effects include: - Ocular or myonclonus, hyperreflexia, tremor, ataxia Autonomic disturbances include: - Diaphoresis, diarrhea, tachycardia, hyperpyrexia, hypo/hypertension, mydriasis

propyl-tryptamine) and AMT (alpha-methyltryptamine) are hallucinogenic amphetamines and tryptamines respectively. Their use is low, but reportedly increasing. Their effects are closer to that of mescaline; hallucinations are often characterized as visual distortions as compared to true visions. The tryptamines, in particular, are chemically related to ergotamines and serotonin and cause significant gastrointestinal upset, which can deter repeated use. Dx

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