SDRL Laboratory

TOXICOLOGY TIMES

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Benzodiazepines (part 1) - Overview

The Benzodiazepines are a class of drugs with sedative, depressant, anticonvulsant, and muscle relaxant properties. The "mood altering" effect of the Benzodiazepines was discovered by Leo Sternbach in 1955. Hoffman LaRoche, in a concerted research effort to discover drugs that could be formulated and used for their beneficial psychoactive properties, released Librium in 1960 after FDA clearance. Three years later Valium was released and for nearly two decades was the most prescribed medication in the United States. There are currently some 36 biologically active drugs in the Benzodiazepine family.

The main use of the Benzodiazepines is in the treatment of anxiety (short-term or disabling), insomnia and some stress-related ailments. The long-term use of these medications produces tolerance and dependency, and in some cases, addiction.

Benzodiazepines are a safer group of compounds when compared to the class of Barbiturates (Amobarbital, Phenobarbital, Secobarbital, etc.) and the tricyclic antidepressants (Amitryptline, Desimipramine, Imipramine, etc.), and they have all but replaced these other medications.

The below table lists general information on the most common Benzodiazepines. Benzodiazepines are typically classified as belonging to one of three categories: short, intermediate or long-acting. The short-acting Benzodiazepines have half-lives of less than 6 hours; the intermediate have half-lives of 6 to 10 hours; and the long-acting have half-lives greater than 10 hours. This is in terms of the residual sedative the patient feels after the time period.

In the table, the most frequently prescribed Benzodiazepines to an outpatient population are shown in capital letters. At SDRL, these Benzodiazepines are the ones analyzed for when a GC/MS confirmation is requested.

The April issue of *Toxicology Times* will focus on interpreting Benzodiazepine laboratory drug-testing results.

Drug Name	Common Brand Names	Therapeutic Category	Pharmacologic Category	Blood Half-Life
ALPRAZOLAM	**Xanax**	**AX**	**SE**	**6 - 27 hours**
Bromazepam	Brazepam, Lexotan	AX	SE	8 - 19 hours
Chlordiazepoxide	Librium	AX	SE	5 - 25 hours
Clobazam	Frisium, Urbanol	AN, AX	SE	10 - 30 hours
CLONAZEPAM	**Klonopin**	**AN**	**SEHY**	**19 - 60 hours**
Clorazepate	Tranxene	AX	SE	36 - 100 hours
DIAZAPEM	**Valium**	**AX**	**SE**	**36 - 200 hours**
Flunitrazepam	Rohypnol	HY	SEHY	9 - 25 hours
Flurazepam	Dalmane	HY	SEHY	40 - 250 hours
Loprazolam	Dormonoct	HY	SEHY	6 - 8 hours
LORAZEPAM	**Ativan**	**AN, AX, HY**	**SEHY**	**9 - 16 hours**
Lormetazepam	Loramet, Noctamid	HY	SEHY	11 - 13 hours
Medazepam	Nobrium	AX	SE	36 - 150 hours
Midazolam	Dormicum, Versed	AX, SE	SEHY	1 - 4 hours
NITRAZEPAM	**Alodorm, Mogadon**	**HY**	**SEHY**	**17 - 48 hours**
OXAZEPAM	**Serax**	**AX**	**SE**	**4 - 11 hours**
Prazepam	Centrax	AX	SE	36 - 200 hours
Quazepam	Doral	HY	SEHY	25 - 100 hours
TEMAZEPAM	**Restoril**	**HY**	**SEHY**	**3 - 13 hours**
Triazolam	Halcion	HY	SEHY	2 - 4 hours

AX = Anxiolytic AN = Anticonvulsant HY = Hypnotic SE = Sedative SEHY = Sedative-Hypnotic

??? Did You Know ???

The best way to establish how long a drug will stay in the body is determined by the plasma half-life of the drug. A half-life indicates the amount of time it takes for the original drug concentration to decrease by half. In other words, how long it takes for ½ of the drug to be eliminated from the system. Each drug has a unique half-life timeframe - minutes, hours or in some cases weeks. For example, Codeine has a plasma half-life of 2-4 hours. It is expected that a plasma Codeine concentration will decrease by half every 2-4 hours (i.e. 100 ng/mL → 50 ng/mL → 25 ng/mL → 12.5 ng/mL, etc.).

Question of the Month

Question: *Is it safe to breastfeed while on methadone?*

Answer: Only a very small amount of methadone is passed along to a baby through breast milk. It is generally believed that the benefits of breastfeeding while being treated with methadone – the passing on of vital nutrients to the baby and mother-baby bonding – far outweigh any potential risks. Methadone levels in breast milk reach their peak between two and four hours after dosing. As such, it is suggested that women avoid breastfeeding during this time when possible. Since the fetus was exposed to methadone in the uterus, breast feeding could reduce the need for ancillary medication in the early postpartum period.