

### Benzodiazepine Interpretation Aids

Benzodiazepines are extensively metabolized, and the parent compounds may not be detected in urine. Alprazolam, clonazepam, and midazolam each have one major metabolite. These are alpha-hydroxyalprazolam, alpha-hydroxymidazolam, and 7-aminoclonazepam, respectively. In contrast, diazepam (Valium®) forms three measurable metabolites: nordiazepam, oxazepam, and temazepam. A patient on diazepam may test positive for all of these.

Benzodiazepine Cut-off and Approximate Urine Detection Times		
Drug/Metabolite	LC-MS/MS Cut-off (ng/mL)	Approximate Urine Drug Detection Window
Alprazolam	50	1-4 days
Alpha-hydroxyalprazolam	50	
Flunitrazepam	50	1-4 days
7-Aminoflunitrazepam	50	
Clonazepam	10	1-4 days
7-Aminoclonazepam	50	
Flurazepam	50	1-2 days
Hydroxyethylflurazepam	50	
Midazolam	50	1-2 days
Alpha-hydroxymidazolam	50	
Diazepam	10	1-7 days
Nordiazepam	50	1-10 days
Lorazepam	50	1-7 days
Lorazepam-glucuronide	50	
Oxazepam	50	1-7 days
Oxazepam-glucuronide	50	
Temazepam	50	1-4 days
Temazepam-glucuronide	50	
Triazolam	50	1-2 days

## & Preferred Lab Partners

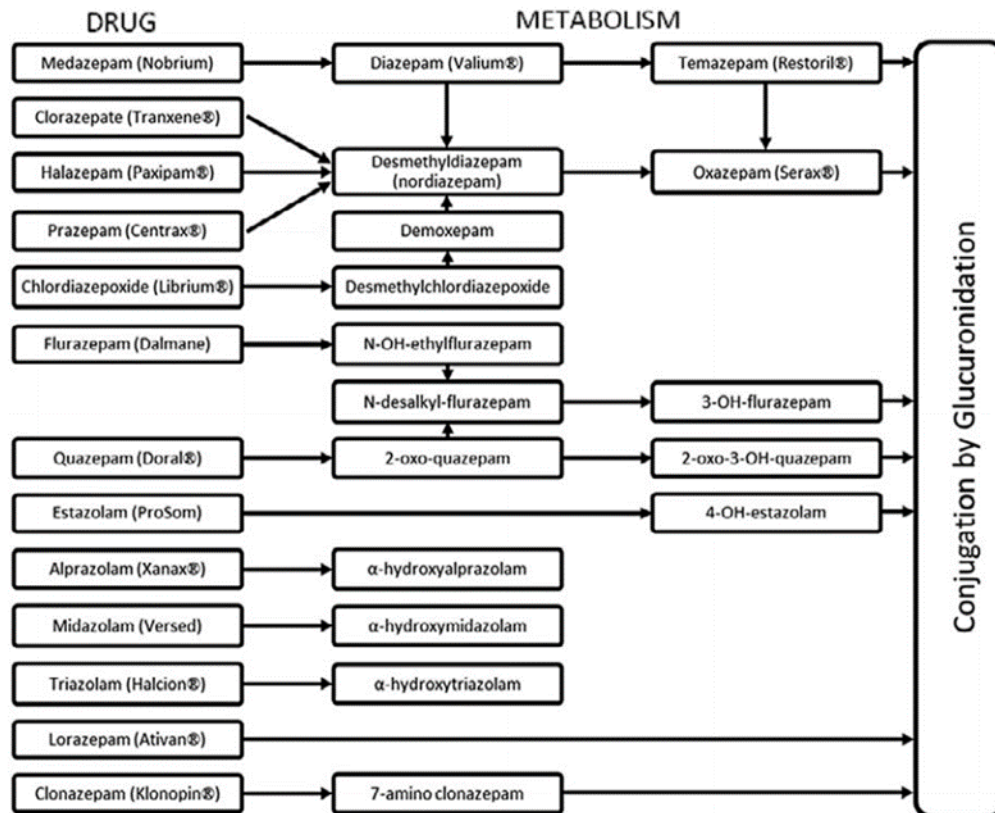


Image from Pesce, A., et al. Interpretation of Urine Drug Testing in Pain Patients. Pain Medicine 2012;13:868-885.