

## Serum Buprenorphine

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Buprenorphine is semi-synthetic opiate derivative of Thebaine and is one of the most active morphine alkaloids. It is used in maintenance of the opiate addicted patient in a treatment modality that has some benefits over the mainstay medication of Methadone. The main difference between the two medications is that buprenorphine has a longer half-life (time to metabolize 50% of the dose) and can be prescribed as a take home medication. This take-home medication is formulated with Naloxone, and is called Suboxone. The drug buprenorphine was first marketed in 1980 as an analgesic (general pain relief), and the drug was subsequently approved by the Food and Drug Administration (FDA) in 2002. This approval was for Subutex and Suboxone for detoxification and long term drug treatment in opiate dependent patients.

**Dosage, Metabolism, and elimination of Buprenorphine**

The dosage for Buprenorphine is in the

range of 2-16 mg per day, with medication in tablet format at 2 and 8 mg per tablet. The dosage can be higher depending on the patient response and needs. Toxic symptoms include confusion, dizziness, pinpoint pupils, hallucinations, hypotension, respiratory difficulties, and in overdose situations can lead to seizures and coma.

Blood or serum concentrations are varied. At San Diego Reference Laboratory (SDRL) we find that the experience with the values and the concentration lead to values in the 1 to 8 ng/mL range. We find a lot of patients with negative urine values who are on 2 mg tablet per day. The literature supports these levels. Sublingual administration of 2 mg of buprenorphine to six healthy males resulted in peak plasma levels of 1.6 ng/mL (Everhart et al., 1997). A 4mg sublingual dose given to six men gave plasma values of 3.3 and 0.31 ng/mL for buprenorphine and norbuprenorphine at 4 hours post dose (Kuhlman et al. 1996). Opiate dependent subjects treated with 8 mg per day sublingually

during maintenance therapy had buprenorphine values in the 1 to 8 ng/mL range (Debrabandere et al., 1991). We at SDRL generally agree with this range for serum levels with our limited amount of data, and feel that the therapeutic range for maintaining the correct dose in the patient will be refined as more data is collected over time.

The metabolism of buprenorphine is to norbuprenorphine and then conjugation with glucuronide. The primary metabolite norbuprenorphine is pharmacologically active. This means that the pharmacological effect is the total of the concentration of the buprenorphine and the norbuprenorphine. The determination of the drug in urine or serum by immunoassay usually is directed to the parent or the metabolite or both. The interpretations of values by immunoassay are hampered by this cross reactivity and care must be used when interpreting negative value.

*Please direct all questions to Client Services at SDRL 1-800-677-7995*

### ??? Did You Know ???

That a Creatinine test as part of a Clinical Urinalysis panel is different than a Creatinine test on a drug screen? A Clinical Urinalysis (UA) is typically ordered by a physician as part of a general health screening to evaluate proper kidney function or to monitor patients with diabetes. A Creatinine screen performed on a drug screen panel is utilized to help evaluate if a urine sample has been normally voided or has been potentially altered or substituted. For the purpose of a drug screen, a Creatinine level greater than 20 mg/dL is considered acceptable as normally voided human urine whereas a Creatinine value lower than 20 mg/dL may indicate sample dilution or substitution. On a drug screen, no further judgment of Creatinine values is made beyond sample validity.

### Question of the Month

**Question:** *What is the difference between Subutex or Suboxone?*

**Answer:** When buprenorphine is injected heroin addicts identify the effects of the buprenorphine as heroin. This study was conducted in addicts that were opiate free and given placebo, other opiates, and buprenorphine. It is therefore considered abusable in the pill form. Subutex is buprenorphine only, and there is the possibility for abuse when this medication is given. Suboxone is formulated with naloxone and when it is injected it precipitates withdrawal. When Suboxone is consumed orally it does not have this effect. It is considered the medication of choice for treating the opiate dependent individual.

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