



## HYDROCODONE

(Trade Names: Vicodin<sup>®</sup>, Lortab<sup>®</sup>, Lorcet-HD<sup>®</sup>, Hycodan<sup>®</sup>, Vicoprofen<sup>®</sup>)

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### Introduction:

Hydrocodone diversion and abuse has escalated in recent years. Since 2009, hydrocodone has been the second most frequently encountered opioid pharmaceutical in drug evidence submitted to federal, state and local forensic laboratories as reported by DEA's National Forensic Laboratory Information System (NFLIS) and System to Retrieve Information from Drug Evidence (STRIDE).

### Licit Uses:

Hydrocodone is an antitussive (cough suppressant) and narcotic analgesic agent for the treatment of moderate to moderately severe pain. Studies indicate that hydrocodone is as effective, or more effective, than codeine for cough suppression and nearly equipotent to morphine for pain relief.

Hydrocodone is the most frequently prescribed opiate in the United States with more than 139 million prescriptions for hydrocodone-containing products dispensed in 2010 and more than 36 million in the first quarter of 2011 (IMS Health<sup>™</sup>). There are several hundred brand name and generic hydrocodone products marketed. All are combination products and the most frequently prescribed combination is hydrocodone and acetaminophen (Vicodin<sup>®</sup>, Lortab<sup>®</sup>).

### Chemistry/Pharmacology:

Hydrocodone [4,5 $\alpha$ -epoxy-3-methoxy-17-methylmorphinan-6-one tartrate (1:1) hydrate (2:5), dihydrocodeinone] is a semi-synthetic opioid most closely related to codeine in structure and morphine in producing opiate-like effects. The first report, that hydrocodone produces euphoria and habituation symptoms, was published in 1923. The first report of hydrocodone dependence and addiction was published in 1961.

### Illicit Uses:

Hydrocodone is abused for its opioid effects. Widespread diversion via bogus call-in prescriptions, altered prescriptions, theft and illicit purchases from Internet sources are made easier by the present controls placed on hydrocodone products. Hydrocodone pills are the most frequently encountered dosage form in illicit traffic. Hydrocodone is generally abused orally, often in combination with alcohol.

Of particular concern is the prevalence of illicit use of hydrocodone among school-aged children. The 2010 Monitoring the Future Survey reports that 2.7%, 7.7% and 8.0% of 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders, respectively, used Vicodin<sup>®</sup> nonmedically in the previous year.

The American Association of Poison Control Centers (AAPCC) reports that in 2009, there were 27,753 total exposures, 12,559 single exposures and 31 deaths associated with hydrocodone in the U.S. The 2009 National Survey on Drug Use and Health (NSDUH) reports

that 9.3% (23.5 million people) of the U.S. population, aged 12 and older, used hydrocodone for nonmedical purposes in their lifetime. In 2009, an estimated 86,258 emergency department visits were associated with nonmedical use of hydrocodone, according to the Drug Abuse Warning Network (DAWN ED).

As with most opiates, abuse of hydrocodone is associated with tolerance, dependence, and addiction. The co-formulation with acetaminophen carries an additional risk of liver toxicity when high, acute doses are consumed. Some individuals who abuse very high doses of acetaminophen-containing hydrocodone products may be spared this liver toxicity if they have been chronically taking these products and have escalated their dose slowly over a long period of time.

### User Population:

Every age group has been affected by the relative ease of hydrocodone availability and the perceived safety of these products by medical prescribers. Sometimes viewed as a "white collar" addiction, hydrocodone abuse has increased among all ethnic and economic groups.

### Illicit Distribution:

Hydrocodone has been encountered in tablets, capsules, and liquid form in the illicit market. However, hydrocodone tablets with the co-ingredient, acetaminophen, is the most frequently encountered form. Hydrocodone is not typically found to be clandestinely produced; diverted pharmaceuticals are the primary source of the drug for abuse purposes. Doctor shopping, altered or fraudulent prescriptions, bogus call-in prescriptions, diversion by some physicians and pharmacists, and drug theft are also major sources of the diverted drug.

The DEA's NFLIS and STRIDE databases indicate that forensic laboratories identified 44,815 exhibits as hydrocodone in 2010 and 8,358 exhibits as hydrocodone in the first quarter of 2011.

### Control Status:

The U.S. Congress placed hydrocodone (bulk or single entity products) in schedule II of the CSA and its products containing specified doses in combination with specified amounts of isoquinoline alkaloid of opium or one or more nonnarcotic substances in recognized therapeutic amounts as schedule III products when the CSA was enacted.

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section, Fax 202-353-1263, telephone 202-307-7183, or E-mail ODE@usdoj.gov.