COLORADO
Department of Public Health & Environment

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RE: Confusion about marijuana tests, pros/cons of each, where the science is currently stands:

Comparison of THC Screening Tests

There are important distinctions between testing positive for THC and being currently impaired. Certain tests have the capability to determine current impairment and others do not. Here we discuss each individual test currently available, and the strengths and limitations of each.

Urine drug screening tests for marjuana test for the presence of THC metabolites. THC metabolites in urine are non-psychoactive and cannot be used as an indicator of current impairment. THC metabolites can be present and detectable in urine for up to 30 days post marijuana consumption. Urine drug screening tests cannot distinguish how recently marijuana was used. The test has been the standard for a workplace drug screening due to the low cost, non-intrusive administration and ease of interpretation (+/- for each substance tested). However urine tests for THC are not accurate or reliable for determining current impairment.

Blood can be tested for delta-9 THC, the psychoactive element of marijuana that causes impairment. However, blood tests are dependent on how quickly the blood can be drawn as amounts of delta-9 THC decrease rapidly in the blood after use. A blood test will show the amount of delta-9 THC in the blood at the time the blood sample is taken, which may not be relative to the time the person was manifesting impairment. Although accurate for measuring the amount delta-9 THC in the blood, these tests are unreliable in determining current impairment. Additionally, there is little correlation between any specific level of delta-9 THC in the blood and impairment in general. Since impairment can vary by level of user (ex. less than weekly use compared to daily/near daily use) interpretation of impairment based on blood test results can be subjective and argued. Blood tests are also intrusive and may cause pain and discomfort to an individual when administered. They may not be practical in the workplace as they require a phlebotomist or someone trained and certified in methods of drawing blood. These tests are also expensive.

Point of contact (POC) oral fluid testing tests for the presence of delta-9 THC in oral fluid. These newer technology tests are reliable and accurate in detecting the presence of delta-9 THC but are inaccurate and unreliable in determining the amount of delta-9 THC. Like urine drug screen tests, oral fluid drug testing is a test of drug use, not impairment. Similar to blood tests, it is not possible to correlate a specific quantity of delta-9 THC concentration in oral fluid directly to degree of impairment. Canada currently utilizes these tests in field testing for DUI, but requires additional evidence such as blood tests or screening by a drug recognition expert to support the results of an oral fluid test. Although this test may be practical for use in the workplace, oral fluid processing is not currently common to most laboratories and may come at a higher expense.

Impairment in the Workplace

The Retail Marijuana Public Health Advisory Committee (RMPHAC) and the Colorado Department of Public Health and Environment (CDPHE) regularly review the scientific literature on a large number of health related topics,

including marijuana impairment and risk of injury. As mentioned previously individual factors, such as frequency of use and tolerance, may affect impairment and the length of time an individual stays impaired. Impairment also resolves at different rates based on the type of marijuana product consumed. When the RMPHAC and CDPHE examined the relationship between marijuana use and increased workplace injury risk (non-driving injury), they found only limited scientific evidence supporting an association. However, we also acknowledge gaps in the research and data that need to be improved for this important topic to be better understood.

Based on the most current evidence we have, the RMPHAC and CDPHE have made the following statements:

1. Marijuana use may be associated with increased risk of non-driving related workplace injuries

2. The typical marijuana cigarette or joint in Colorado contains approximately 0.5 grams of marijuana, and the THC content in marijuana ranges from 12-23% THC; therefore, a typical joint contains between 60-115 mg THC. The standard serving size for a marijuana edible is 10 mg.

   a) For less-than-weekly marijuana users, smoking, eating, or drinking marijuana containing 10mg or more of THC is likely to cause impairment that affects your ability to drive, bike, or perform other safety-sensitive activities

   b) Wait at least 6 hours after smoking marijuana containing less than 35 mg THC before driving, biking, or performing other safety-sensitive activities. If you have smoked more than 35 mg, wait longer.

   c) Wait at least 8 hours after eating or drinking marijuana containing less than 18 mg THC before driving, biking, or performing other safety-sensitive activities. If you have consumed more than 18 mg, wait longer

RMPHAC and CDPHE have identified the following gaps in research and recommendations:

1. Identification of better methods for measuring meaningful impairment.

2. Research to determine whether THC metabolite ratios may be helpful in defining a better biomarker for impairment.

3. Research to further clarify the relationship of saliva and urine levels to blood levels and relationship of all biomarkers to measures of functional impairment.

4. Research to identify reliable methods of assessing tolerance to marijuana in frequent users and to determine the extent to which tolerance affects impairment.

5. Research to improve road-side marijuana testing.

6. Study the difference in impairment based on frequency of use/tolerance.

7. Accurately record timing of THC blood testing, relevant to recreational, workplace or any other injury requiring medical attention, and specify marijuana use as distinct from other substances.