10 concepts to understand when reading or thinking about *Cannabis* and human milk

1. The bioavailability of the drug itself is critical to understanding the risk of a particular drug. In the case of *Cannabis*, 5-56% is available after smoking, but only 1-5% is available after oral consumption (edibles or breastmilk).
2. All drugs and medications are metabolized - broken down - by the body in some way. The term ***kinetics*** refers to the pattern of entry and removal of the drug into the bloodstream or breastmilk.
3. This pattern is often a curve - the drug enters the bloodstream due to consumption and increases to a peak. Metabolism (removal) of the drug then begins to decrease the concentration of drug in the bloodstream/milk.
4. For nearly all drugs and medications, plasma kinetics reflects breastmilk kinetics. In other words, what happens in plasma, happens in breastmilk - like a mirror reflection - often in real time. Alcohol, for example, is metabolized from the bloodstream in about 2 hours for each drink - this is also the case in the milk. This is why nursing parents are often advised they can nurse 2 hours after an alcoholic drink.
5. There are a number of common parameters used to describe the kinetics of medications in milk, including *Cavg* (the average drug concentration across the time of exposure), *Cmax* (the maximum drug concentration across the time of exposure, *Tmax* (the time at which maximum concentration is observed), and *RID* (relative infant dose for the drug in milk).
6. The relative infant dose (RID) = the infant dose received via milk (mg/kg/day) / the mother's dose (mg/kg/day). It is expressed as a percentage. Typically, a drug with an RID less than 10% is considered safe to use while breastfeeding. RID is generally a more useful parameter to evaluate safety and risk than milk/plasma ratio (M/P ratio). M/P ratio does not describe the dose the infant receives, limiting its applicability.
7. Drs. Teresa Baker and Thomas Hale at the InfantRisk Center seek to describe the kinetics and biovailability of drugs/medications used by nursing parents. The goal of the InfantRisk Center is to provide data so that together, parents and professionals can evaluate the risk of a particular drug.
8. There are three important molecules involved in the metabolism of *Cannabis* in the human body. THC is a psychoactive molecule that is metabolized quickly into 11-OH-THC (11-hydroxy-THC) and then COOH-THC (carboxy-THC, also called 11-nor-carboxy-THC).
    - *THC* is the psychoactive molecule that makes you feel stoned after inhaling cannabis.
    - *11-OH-THC* is an additional primary psychoactive molecule after eating cannabis (and may be one of the reasons edibles can be so potent).
    - *COOH-THC* is a NON-psychoactive molecule that can be stored in certain tissues (such as adipose and thymus) for days or weeks and is the molecule used in the *detection* of THC exposure.
9. Parents and babies are *not* tested for THC in labor or at birth, they are tested for COOH-THC, the *non-psychoactive* molecule. Testing positive for COOH-THC tells you nothing about the timing or size of the cannabis exposure. If you would like more information on these molecules, check out our Molecules 101 fact sheet.
10. A nanogram (ng) is one millionth of a milligram. One mg = 1,000,000 ng. THC concentration is often expressed as ng/mL of the fluid studied (plasma or milk) or ng/g (in the case of the cord and meconium).

For more information, please contact Heather Thompson, PhD at heather@elephantcircle.org