

# MARIJUANA IN MOTHER'S MILK...

## SURE ITS NATURAL, BUT IS IT SAFE?

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# HUMAN MILK IS THE UNDISPUTED BEST FOR BABY

- PRIORITIZED FOR PRETERM AND TERM INFANTS
- MULTIPLE HEALTH BENEFITS
- IMPROVED OUTCOMES FOR PRETERM BABIES
- RISK VS. BENEFIT DECISIONS

- MATERNAL INFECTIONS
- MATERNAL MEDICATIONS
- NEONATAL WITHDRAWAL INFANTS
- ALCOHOL USE
- ILLICIT DRUGS INCLUDING MARIJUANA





# MARIJUANA IN PREGNANCY AND LACTATION





# LEGALIZATION OF MARIJUANA BOTH MEDICAL AND RECREATIONAL

- LEGALIZATION OF MARIJUANA HAS LED TO AN INCREASED USE AMONG ALL AGES
- USE BY PREGNANT WOMEN HAS INCREASED
  - PREVIOUSLY REPORTED AT 2-5% USE AMONG PREGNANT WOMEN (2002)
    - INCREASED TO 7% BY 2017
    - 12% IN FIRST TRIMESTER WOMEN
  - INCREASES TO 15-28% OF WOMEN:
    - IN LOW SOCIOECONOMIC SETTINGS
    - URBAN SETTINGS
- DISPENSARIES MAKE ACQUISITION EASIER
  - “STORE” LIKE SETTINGS
  - UBER FOR MARIJUANA





2015 STUDY BY THE NATIONAL SURVEY ON DRUG  
USE AND HEALTH (NSDUH)

78,000 PREGNANT WOMEN  
REPORTED USING MARIJUANA  
IN 1 MONTH!



# WHY USE MARIJUANA DURING PREGNANCY AND LACTATION?

- MANY ADULTS AND PARENTS ARE LOOKING TO RELIEVE STRESS AND ANXIETY
  - WANT TO REDUCE USE OF ALCOHOL AND MEDICATIONS (DON'T TRUST BIG PHARMA)
  - NEED TO REDUCE LEVELS OF STRESS RELATED TO JOBS, PRESSURES, PARENTING
  - MOST WHO USE MARIJUANA AS A ROUTINE PART OF LIFE HABITS WILL CONTINUE INTO PREGNANCY



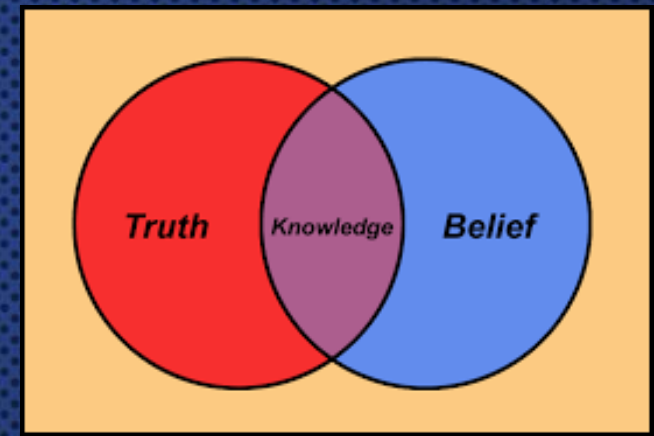


# MOST CONSUMERS REPORT WANTING TO DECREASE DEPENDENCE ON:

- MOST CONSUMERS REPORT WANTING TO DECREASE DEPENDENCE ON:
  - MEDICATIONS AND THEIR SIDE EFFECTS
    - FEEL THAT MARIJUANA IS A MORE NATURAL AND SAFER ALTERNATIVE
    - MANY WOMEN WHO USE MARIJUANA FOR SYMPTOM RELIEF DURING PREGNANCY WILL CONTINUE TO DO SO INTO THE 3<sup>RD</sup> TRIMESTER AND DURING LACTATION
      - 34-60% OF MJ USERS FEEL IT IS SAFE TO USE DURING PREGNANCY AND LACTATION



# BELIEFS ASSOCIATED WITH MARIJUANA

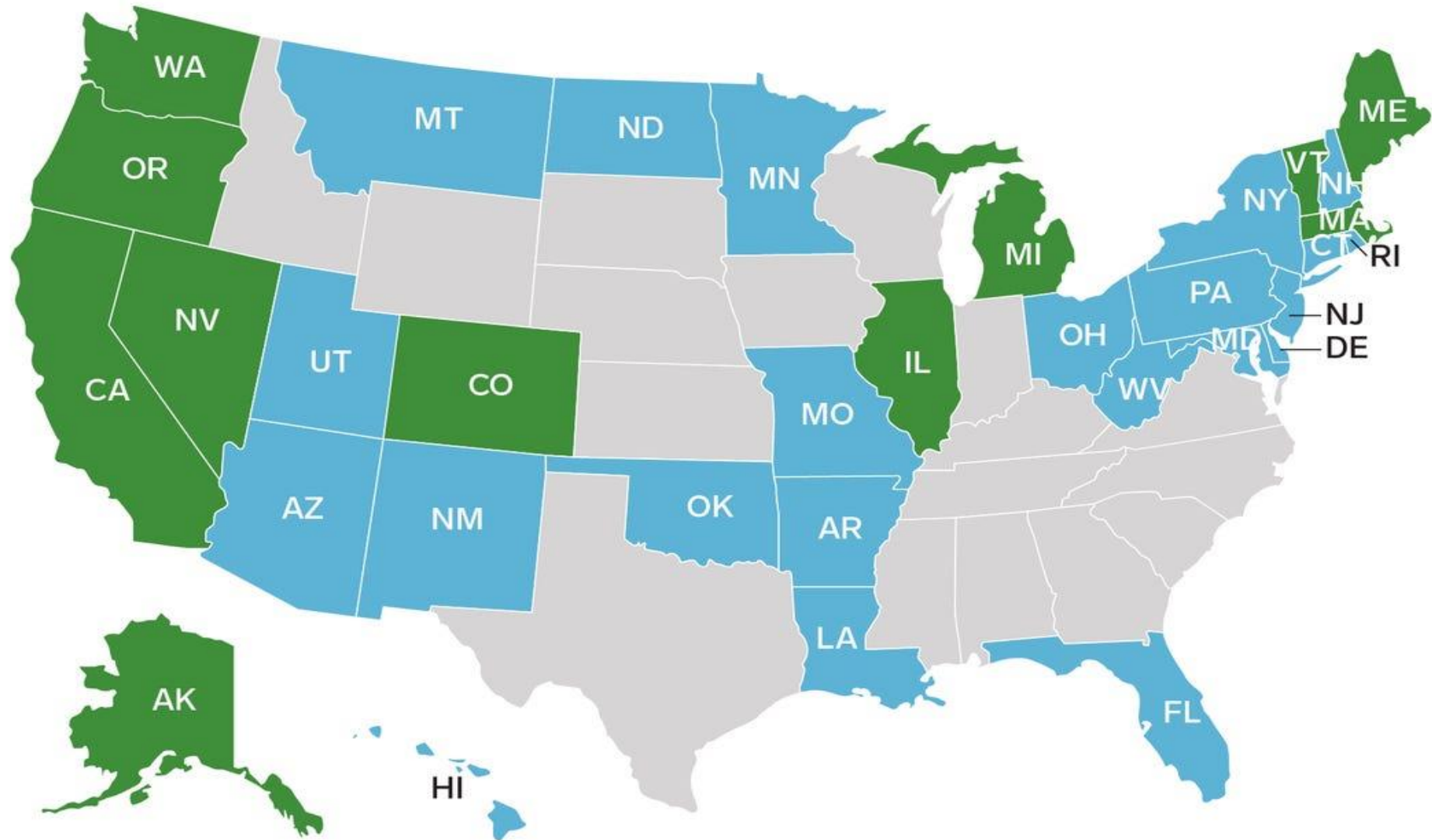


- MARIJUANA IS NOT DIRECTLY ASSOCIATED WITH FETAL BIRTH DEFECTS SO IT ISN'T DANGEROUS
- MARIJUANA IS A NATURAL PLANT SO THERE IS NO HARM TO THE BABY
- THERE IS NO WITHDRAWAL FROM MARIJUANA SO IT IS SAFE
- IF MY DOCTOR SUGGESTS IT, WHY NOT?



# States where marijuana is legal

■ Legalized recreational and medical marijuana   ■ Legalized medical marijuana



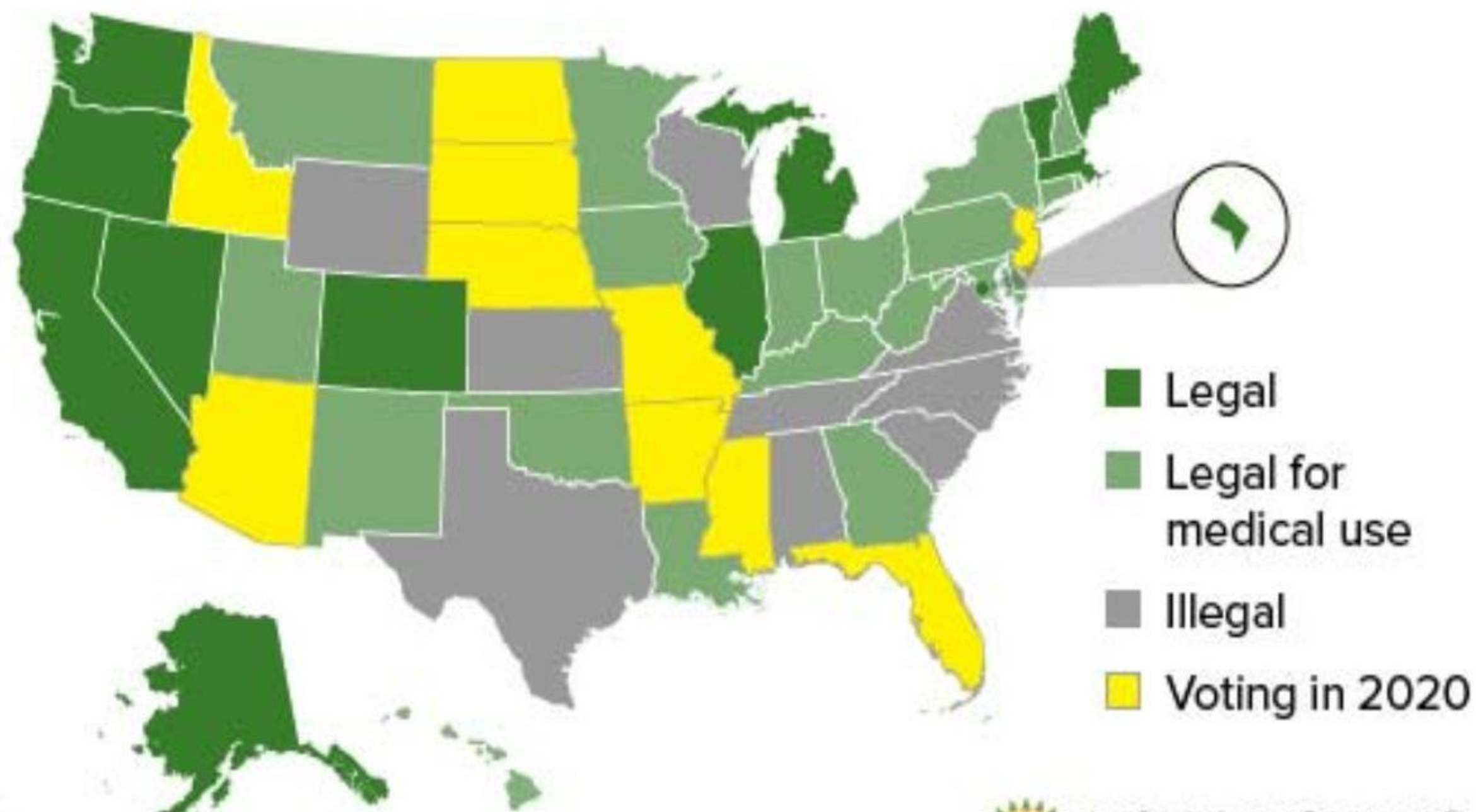


ON THE  
TICKET  
FOR  
2020





Ten states could have some form of legal marijuana on the ballot next year.







# WHAT DO WE KNOW ABOUT MARIJUANA AND THE BRAIN?



# ENDOCANNABINOID SYSTEM (ECS)

- PRESENT IN THE DEVELOPING FETUS AT 16 WEEKS GESTATION
- EXTREMELY IMPORTANT IN THE DEVELOPING NEONATAL BRAIN AND NEURONAL CIRCUIT
  - RESPONSIBLE FOR DIFFERENTIATION OF STEM CELLS INTO NEURONS AND GLIAL CELLS
  - GUIDES THE MIGRATION OF GLIAL CELLS INTO THE CREATION OF THE MATRIX FOR NEURONS
  - NEURONS DIFFERENTIATE INTO AXONS AND DENDRITES
  - THEN PLANT THEMSELVES INTO THE MATRIX TO DEVELOP SYNAPSES





Weeks

1

13

26

40

Neurons develop

Neurons multiply

Neurons migrate

Neurons branch, form synapses

Pruning (apoptosis)

Synapses reorganize

Myelination

1st TRIMESTER

2nd TRIMESTER

3rd TRIMESTER



# ENDOCANNABINOID SYSTEM

- MIGRATION DURING DEVELOPMENT BRINGS DIFFERENT CLASSES OF NEURONS TOGETHER SO THAT THEY CAN INTERACT APPROPRIATELY
- THESE SYNAPSES WILL CONDUCT IMPULSES AND MESSAGES
- EVENTUALLY CONTROL SENSORY AND MOTOR PROCESSING
- CONTINUE DEVELOPING OVER THE NEXT **20** YEARS!



# ENDOCANNABINOID SYSTEM CONT'D

PROPER DEVELOPMENT OF THIS CIRCUITRY IS CRITICAL FOR:

- CONTINUED GROWTH AND DEVELOPMENT OF THE FETUS
- FETAL BRAIN DEVELOPMENT
- EVENTUAL POST DELIVERY LEARNING AND DEVELOPMENT

FUNCTIONS CONTROLLED BY THE ECS:

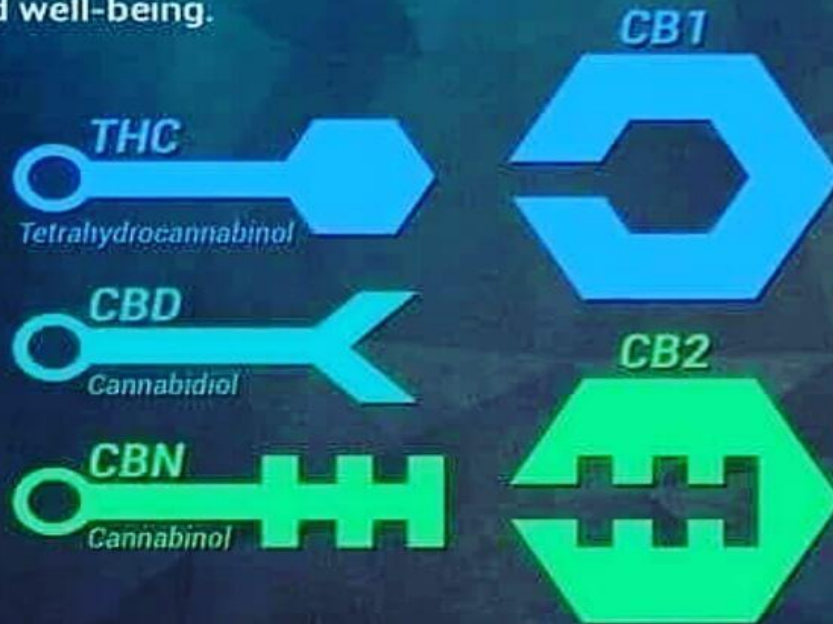
- COGNITION
- SUCKLING
  - CONTROLLING WEIGHT GAIN, HEAD CIRCUMFERENCE, AND LENGTH GROWTH
- MOTOR DEVELOPMENT



# The Human Endocannabinoid System

CBD, CBN, and THC fit like a lock and key into existing human receptors. These receptors are part of the endocannabinoid system which impact physiological processes affecting pain modulation, memory, and appetite, as well as anti-inflammatory effects and other immune system responses.

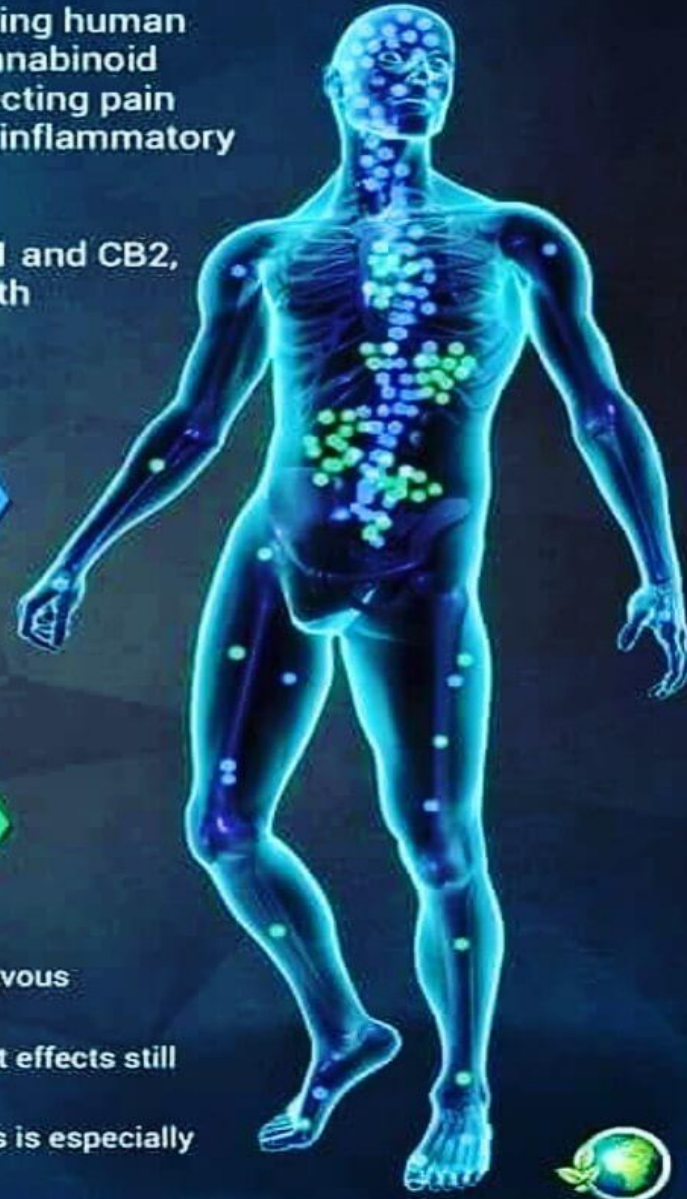
The ECS is comprised of 2 types of receptors - CB1 and CB2, which each serve distinct functions in human health and well-being.



**CB1** receptors are primarily found in the brain and central nervous system, but also in smaller amounts elsewhere in the body.

**CBD** does not directly fit **CB1** or **CB2** but has powerful indirect effects still being studied.

**CB2** receptors are mostly found in the peripheral organs. This is especially true with cells associated with the immune system.





# ENDOCANNABINOID SYSTEM AND MOOD

- THE ECS IS A COMPLEX CELL SIGNALING SYSTEM KNOWN TO CONTROL:
  - MOOD
  - SLEEP
  - APPETITE
  - MEMORY

NEUROACTIVE LIPIDS CONTROL TRANSMITTER RELEASE

2 KEY ENDOCANNABINOIDS ARE KNOWN TO AFFECT THIS SYSTEM:

- ANANDAMIDE
- 2-ARACHIDONOLGLYEROL (2-AG)
- THE BODY PRODUCES THESE NATURALLY



# ECS RECEPTORS

- THESE RECEPTORS ARE FOUND THROUGHOUT YOUR BODY. ENDOCANNABINOIDS BIND TO THEM IN ORDER TO SIGNAL THAT THE ECS NEEDS TO TAKE ACTION.
- THERE ARE TWO MAIN ENDOCANNABINOID RECEPTORS:
- CB1 RECEPTORS, WHICH ARE MOSTLY FOUND IN THE CENTRAL NERVOUS SYSTEM
- CB2 RECEPTORS, WHICH ARE MOSTLY FOUND IN YOUR PERIPHERAL NERVOUS SYSTEM, ESPECIALLY IMMUNE CELLS

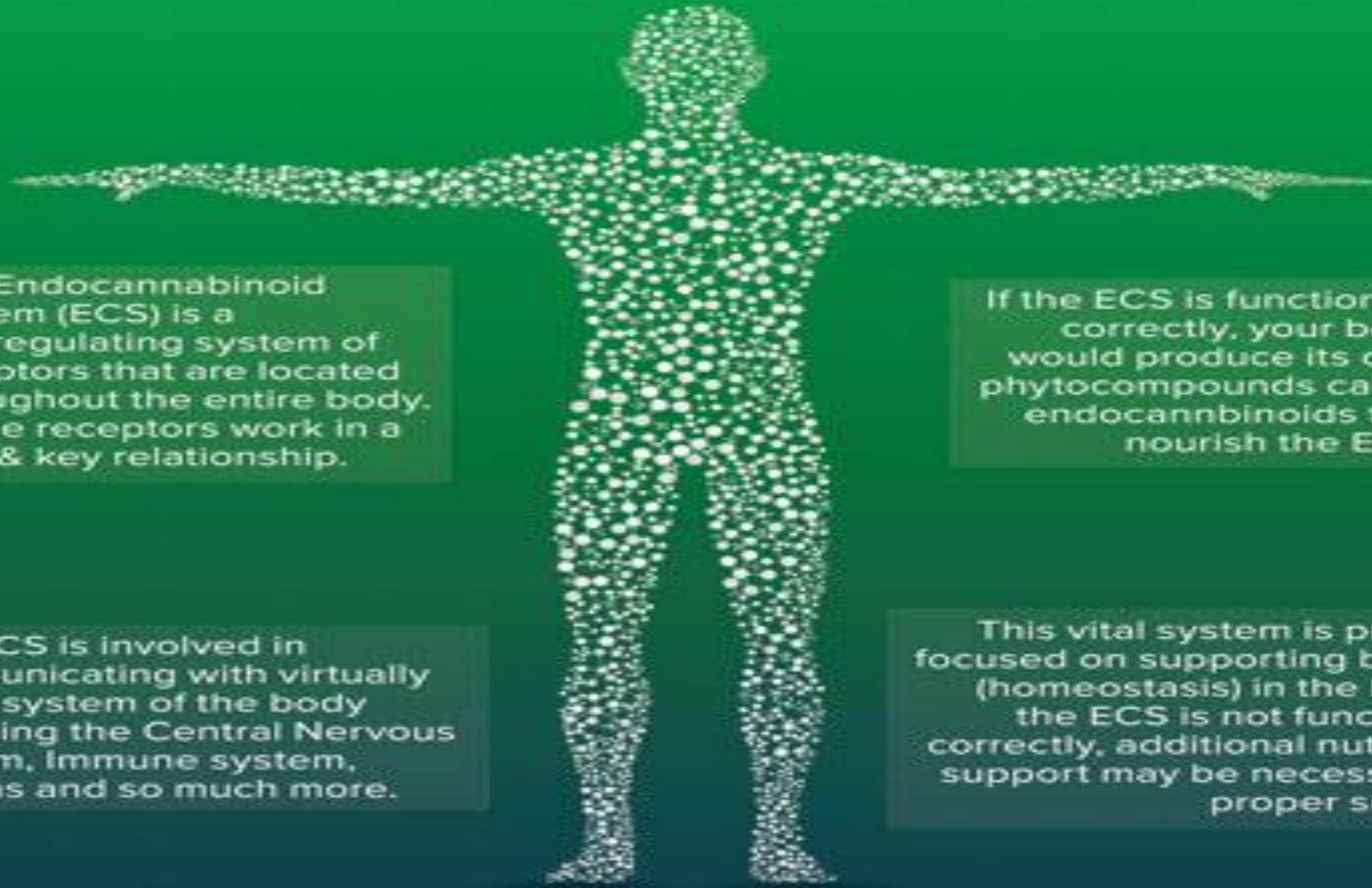


## ECS CONT'D

- THESE RECEPTORS ARE SENSITIVE TO THE NATURAL CANNABINOIDS PRESENT IN BREASTMILK
- THESE RECEPTORS CAN ALSO RESPOND TO THE PRESENCE OF PHYTOCANNABINOIDS PRESENT IN MARIJUANA
- THE GROWTH AND DEVELOPMENT OF THIS ESSENTIAL SYSTEM CAN BE AFFECTED BY PHYTOCANNABINOIDS PRESENT IN THC, THE MAIN CANNABINOID PRESENT IN MARIJUANA
- THESE CANNABINOIDS ARE MUCH STRONGER THAN NATURALLY OCCURRING SUBSTANCES IN BREAST MILK



# THE ENDOCANNABINOID SYSTEM



1

The Endocannabinoid System (ECS) is a self-regulating system of receptors that are located throughout the entire body. These receptors work in a lock & key relationship.

2

If the ECS is functioning correctly, your body would produce its own phytocompounds called endocannabinoids that nourish the ECS.

3

The ECS is involved in communicating with virtually every system of the body including the Central Nervous System, Immune system, Organs and so much more.

4

This vital system is primarily focused on supporting balance (homeostasis) in the body. If the ECS is not functioning correctly, additional nutritional support may be necessary for proper support.





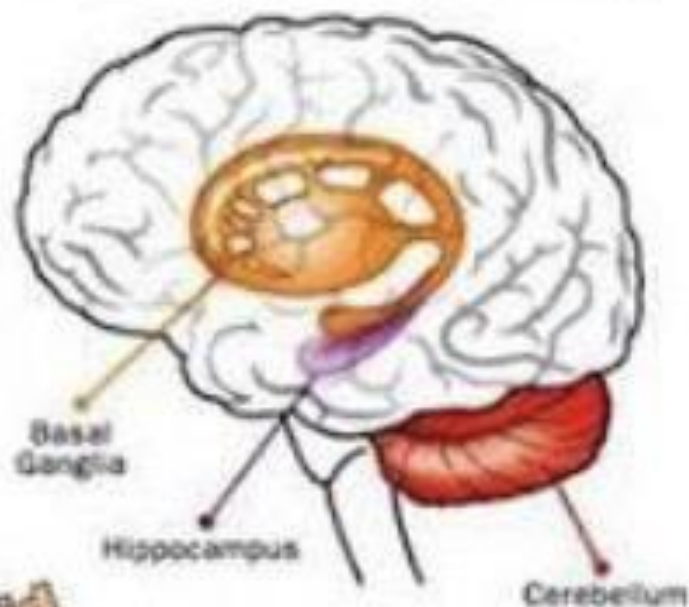
*Commonwealth of Pennsylvania*  
*United For*  
*Freedom*

Cannabinoids similar to those found in cannabis [marijuana] also occur naturally in a mother's breast milk.



**neuromodulatory lipid**

#### Cannabinoid Receptor Sites



Anandamide



2-Arachidonylglycerol (2-AG)

Anandamide and 2-AG activate the same receptors as THC



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## Cannabinoids occur Naturally in Human Breast Milk

The same **Cannabinoids** found in Industrial **Hemp** are also found in breast milk. This may initially sound shocking to some, but the fact is that these **Cannabinoids** have an important purpose in the growth and development of babies. **Cannabinoids** promote hunger in newborns, which ensures both an adequate milk supply in the mother and enough nutrition for baby.



**HEMP+**®



## ECS CONT'D

- EXPOSURE TO EXCESSIVE AND STRONGER CANNABINOIDS IS THOUGHT TO OVERSATURATE THE SENSORS AND CAUSE CHANGES TO NORMAL NEURAL DEVELOPMENT
- THC IS HELD IN THE FAT TISSUE AND RELEASED OVER TIME
  - IT CAN REMAIN IN THE SYSTEM FOR UP TO 50 DAYS (DEPENDANT ON FREQUENCY OF USE)
  - THC CROSSES THE PLACENTAL AND FETAL BLOOD-BRAIN BARRIER



# EXPOSURE TO THC HAS BEEN ASSOCIATED WITH A CHANGE IN:

- EXPRESSION OF GENES
- CHANGES IN THE CELL MIGRATION AND PROLIFERATION
- DISRUPTION OF THE AXONS
- CHANGES IN SYNAPTIC SELECTIVITY



QUESTIONS, DISCUSSION, REFERENCES???



JUST CONTACT ME AND I AM HAPPY TO SHARE  
OR DIALOG ABOUT THIS SUBJECT AND HOW WE  
CAN INFLUENCE BEST OUTCOMES!

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# THC AND THE ECS IN LACTATION

BECAUSE THC LOVES TO STAY IN THE FAT 😊:

- THC HAS AN AFFINITY FOR BREAST MILK
- AGAIN, IT STAYS IN THE MOM'S BODY UP TO 50 DAYS (DAILY USERS)
  - NO POSSIBILITY TO "PUMP AND DUMP"
  - MOM'S MILK IS BELIEVED TO HAVE 8 TIMES MORE THC THAN HER PLASMA
- BABY'S BRAIN RECEIVES FAT AND PROTEINS FROM THE BREASTMILK PREFERENTIALLY
- BABY RECEIVES A POTENTIALLY HIGH LOAD OF MARIJUANA EVERY TIME MOM BREASTFEEDS
- THC CONTINUES TO HAVE AN EFFECT ON THE BABY'S ECS AND FURTHER DEVELOPMENT OF THE BRAIN
- MOTOR DEVELOPMENT, SUCKLING, AND COGNITION CAN STILL BE AFFECTED



EFFECTS OF CANNABINOID USE  
DURING PREGNANCY  
ON THE GROWING FETUS AND CHILD



- ↑ Increased
- ↓ Decreased
- ▲ Altered

↓ Birth weight



## NEONATE



↓ Birth weight

↓ Dopamine D2 receptor levels in brain

↑ Hyperactivity

↑ Anxiety

↓ Synapse formation

↓ Glutamate signaling in prefrontal cortex

↓ Dopamine D2 receptor levels in brain



## EARLY DEVELOPMENT



↓ Verbal reasoning scores

↓ Short-term memory

↑ Aggression (females)

↑ Anxiety and depression

↑ Impulsivity and inattention

↑ Hyperactivity

↑ Anxiety

↓ Memory consolidation

↓ Socialization



## ADOLESCENCE



↑ Depressive symptoms

↓ Abstract reasoning

↑ Delinquency, antisocial behavior

↓ Socialization

↑ Anxiety

↑ Opioid-seeking

↓ Short-term memory

↓ Synaptic plasticity

▲ Gene expression

▲ Opioid receptor abundance in prefrontal cortex

▲ Neuroendocrine signals in the hypothalamus



## ADULTHOOD



↓ Visuo-spatial memory

↑ Drug-seeking



# POTENCY OF MARIJUANA



## GENETICALLY MODIFIED MARIJUANA RESULTS IN STRONGER CONCENTRATIONS AND SPECIFIC BLENDS

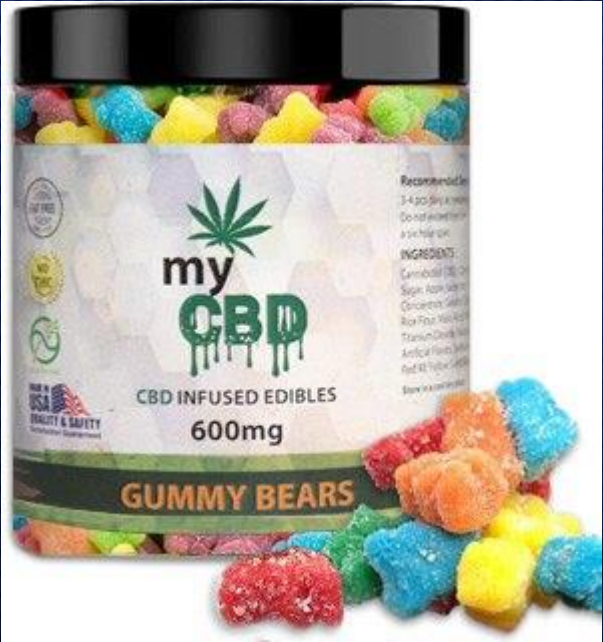
- THC CONTENT OF 1 MARIJUANA CIGARETTE WAS APPROXIMATELY 3.4% IN THE 1990s
- TODAY'S MJ HAS 12-13% AND IS EVER INCREASING!
- EDIBLES CONTAIN EVEN MORE THC
  - APPROXIMATELY 100 MG OF THC ARE IN COMMERCIALLY PREPARED EDIBLES SUCH AS COOKIES
  - IT TAKES APPROXIMATELY 10-30 MG OF THC TO GIVE THAT "HIGH" FEELING
  - MOST PEOPLE DON'T EAT 1/3<sup>RD</sup> OF A COOKIE



# POTENCY CONTINUED

- EFFECTS OF MARIJUANA ARE USUALLY FELT WITHIN:
  - 10 MIN IF SMOKING
  - 30 MINUTES FOR EDIBLES (LONGER DELAY MAY LEAD TO MORE CONSUMPTION)
- MANY CONSUMERS ARE TAKING IN TOO MUCH THC RESULTING IN HIGHER LEVELS TO BABY!







# EARLY STUDIES OF MARIJUANA IN PREGNANCY AND LACTATION

- FRIED 1982
- TENNES AND ASSOCIATES 1985
- DREHER AND ASSOCIATES 1994

SOME ASSOCIATION WITH PRENATAL AND POSTNATAL MARIJUANA:

- TREMORS
- MOTOR DIFFICULTIES
- DECREASED POINTS ON THE BAILEY EVALUATION
- ALTERED VISUAL RESPONSE



# NOTED SIDE EFFECTS AND NEGATIVE OUTCOMES

- DECREASED SCORES ON THE BAILEY SCALE OF INFANT DEVELOPMENT
- DELAYS IN MOTOR DEVELOPMENT
  - SITTING UP, CRAWLING, WALKING, TALKING
  - EXTENDED OUT TO 1 YEAR OF AGE
- SLOW WEIGHT GAIN
- POTENTIAL FOR INCREASE IN SIDS
  - EXPOSURE TO 2<sup>ND</sup> AND 3<sup>RD</sup> HAND SPOKE
  - POTENTIAL PARENTING ISSUES
- POTENTIAL FOR ADDICTION ISSUES LATER IN LIFE
- IMPAIRED MOM AND POSSIBLE UNDERFEEDING, LACK OF ATTENTION, SAFETY ISSUES



# PROLACTIN INHIBITION

- ANIMAL STUDIES SHOW CORRELATION WITH MARIJUANA USE AND DECREASED PROLACTIN PRODUCTION
  - INHIBITS PROLACTIN PRODUCTION
  - HAS A DIRECT EFFECT ON THE MAMMARY GLANDS
- PROLACTIN IS RESPONSIBLE FOR MILK PRODUCTION
- POOR MILK PRODUCTION COUPLES WITH THE EFFECTS OF MARIJUANA ON THE BREASTFEEDING INFANT CAN RESULT IN:
  - SEDATIVE EFFECTS ON THE INFANT
  - POOR SUCKLING
  - POOR MILK INTAKE
  - POOR WEIGHT GAIN



# WHAT ARE THE RECOMMENDATIONS?

DO NOT BREASTFEED WHILE USING MARIJUANA:

- AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS (ACOG)
- AMERICAN ACADEMY OF PEDIATRICIANS (AAP)

SCREENING FOR ALL PREGNANT MOTHERS

OPEN CONVERSATION BETWEEN STAFF AND MOMS

STANDARDIZATION OF PROTOCOLS (DEPENDENT UPON STATE REGULATIONS)

DOWN GRADED FROM AN L5 TO A L4 BY DR THOMAS HALE  
(HALE/MEDICATIONS AND MOTHER'S MILK)



BUT... YOU FIND WHAT YOU LIKE!



# DR HALE AND ASSOCIATES STUDY

- 8 MOTHERS WERE RECRUITED
- ALL HAVE A HISTORY OF MJ USE
  - MOST WERE OCCASIONAL USERS 1 – 5 TIMES A WEEK – ONE DAILY 7-10 TIMES A WEEK
  - USE REPORTED AT 0.025 – 1 G PER DAY
- STANDARDIZED MJ WAS USED FROM A DISPENSARY, WEIGHED AND ANALYZED CONSISTENT STRAIN (CONCENTRATION 23.8% THC PER 0.1 G SMOKED)
- MOMS PUMPED PRIOR TO USE AND REFRAINED FOR 24 HOURS – PLASMA LEVELS WERE TAKEN BREAST MILK LEVELS WERE 2 NG/ML
- MOMS SMOKED 0.1 G OF MJ
- SAMPLES WERE TAKEN AT 20 MIN, 1, 2 4 HOURS AFTER SMOKING
- MILK CONCENTRATIONS WERE HIGHEST 1 HOUR AFTER SMOKING
- MOTHER'S PLASMA LEVELS INCREASED RAPIDLY WHERE BREAST MILK LEVELS WERE SLOWER
- INFANTS RECEIVED ABOUT 2.5% THC AFTER CONSUMING MOTHER'S MILK





# Pregnancy and Marijuana



**Your baby will test positive for marijuana if you:**

- **Use during pregnancy**
- **Feed your baby breastmilk if you:**
  - ✓ **smoke**
  - ✓ **vape**
  - ✓ **eat marijuana**

**Marijuana is very strong today. In 1993 it only contained 3.4% THC in one cigarette; now it has 8-12%**

**THC can stay in the Mom's body for up to 30days depending on her metabolism**

**If you are breastfeeding and using marijuana, THC loves fat. There is lots of fat in your breastmilk**

**Your baby gets the THC every time you breastfeed**

***Marijuana use during pregnancy and/or breastfeeding can be harmful to your baby's health***

## **Marijuana/Cannabis can harm your baby**

- Your baby can be of low birth weight
  - Most babies exposed to marijuana during pregnancy are approximately 0.8 pounds lighter than babies who are not
  - Low birth weight babies are more likely to have health problems
- Your baby's normal growth and development can be abnormal
  - Babies who have THC in their system from exposure to smoke or by breastfeeding may have more delays in:
    - sitting up
    - crawling
    - walking
    - speaking
- Babies exposed to second hand smoke are more likely to have a SIDS (sudden infant death syndrome) event
- Babies exposed to marijuana in breast milk are often sleepy. The baby may not eat as often and as much and have slow weight gain.
- The growth and development of your baby's brain can be harmed!
  - Many children later have more trouble in school with paying attention and learning

***Just because marijuana/cannabis is natural and legal doesn't mean it is safe or cannot hurt your baby!***



# DRMC PRACTICE EARLY 2018

- NICU ADOPTED A NO BREASTFEEDING STANCE
  - IF MOM INSISTS, SHE WILL BE EDUCATED ON EFFECTS
  - IF SHE INSISTS, SHE IS ASKED TO SIGN A WAIVER
- PERINATAL WAS REVIEWING RESEARCH
  - CURRENTLY IS A NO BREASTFEEDING STANCE
  - SIGN AN AGAINST MEDICAL ADVICE PAPER
  - NO LACTATION SUPPORT IS OFFERED/SUPPLIED IF ASKED FOR
  - SOCIAL SERVICES APPROACHES MOM AND DISCUSSES CURRENTLY
- WANTED A UNIFORM APPROACH AND SIGNING
- HANSON HOUSE FOR PARENTS...
  - CANNOT STAY AT HANSON HOUSE IF MOM IS POSITIVE FOR MJ





# DRMC CURRENT PRACTICE

- BOTH NICU & PERINATAL CONTINUE TO USE A DO NOT BREASTFEED WHILE USING **ANY** TYPE OF MARIJUANA PRODUCTS (IN KEEPING WITH ACOG AND AAP)
- SOCIAL SERVICES SPEAKS WITH MOM/PARENTS WHO TEST POSITIVE OR HAVE A POSITIVE INFANT
  - DISCUSS POLY SUBSTANCE ABUSE
  - PREVIOUS CPS ISSUES OR ISSUES WITH LAW ENFORCEMENT
  - ASSESSMENT OF MOM, ENVIRONMENT, AND ALL ISSUES IS CONDUCTED
- AFTER COUNCIL, IF MOM INSISTS A WAIVER IS SIGNED
- IF MOM IS IN A TREATMENT PROGRAM, SUCH AS A METHADONE PROGRAM, PERMISSION TO CONSULT WITH PROVIDER OR SW IN THE PROGRAM IS REQUESTED