Lobby

Which pharmacology sessions the Northwest PTTC hosted this month have you attended?

a. Pharmacology of Alcohol (October 8th)
b. Pharmacology of Opioids (October 16th)
c. Pharmacology of Psychostimulants (October 22nd)
d. None, this is my first one!

Northwest (HHS Region 10)

PTTC Prevention Technology Transfer Center Network

Funded by Substance Abuse and Mental Health Services Administration

Pharmacology Basics and Cannabis

What Prevention Practitioners Need to Know

Ron Jackson, MSW, LICSW
Clinical Professor
School of Social Work, University of Washington

Northwest (HHS Region 10)

PTTC Prevention Technology Transfer Center Network

Funded by Substance Abuse and Mental Health Services Administration

The Northwest PTTC is a partnership led by the Social Development Research Group (SDRG) at University of Washington (UW) School of Social Work in collaboration with the Prevention Science Graduate Program at Washington State University (WSU), and the Center for the Application of Substance Abuse Technologies (CASAT) at the University of Nevada, Reno (UNR).

Northwest partnering institutes share a vision to expand the impact of community-activated prevention by equipping the prevention workforce with the power of prevention science.

SDRG

SCHOOL OF SOCIAL WORK
UNIVERSITY of WASHINGTON

Prevention Science Graduate Program
WASHINGTON STATE UNIVERSITY

CASAT
Center for the Application of Substance Abuse Technologies
University of Nevada, Reno

Disclaimer

The views expressed in this webinar do not necessarily represent the views, policies, and positions of the Substance Abuse and Mental Health Services Administration or the U.S. Department of Health and Human Services.

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Upcoming Webinars!

Effectively Managing Family Conflict

December 10, 2020

The Roles of Culture and Collaboration in Preventing Suicide and Substance Misuse in Indigenous Communities

January 21st, 2021

Presenter

Ron Jackson, MSW, LICSW, is a Clinical Professor at the University of Washington's School of Social Work where he teaches courses on addiction and its treatment methods. He recently retired as the Executive Director of Evergreen Treatment Services (ETS), a private non-profit organization, in Seattle, Washington, that provides outpatient opioid treatment in clinics in western Washington and street-based case management services for homeless persons with substance misuse disorders (REACH Program) in Seattle. He served for 10 years as a Co-Principal Investigator for the Washington Node of NIDA's Clinical Trials Network and is currently on the Advisory Board for the NWATTC. Mr. Jackson has worked in the field of addiction treatment since 1972.

ADDICTION

“Addiction is a brain disease shaped by behavioral and social context.”

Dr. Alan Leshner, Former Director

National Institute on Drug Abuse

“Drug addiction is associated with altered cortical activity and decision making that appears to overvalue reward, undervalue risk, and fail to learn from repeated errors.”

Dr. Nora Volkow, Director

National Institute on Drug Abuse

“Any disease that is treated as a mystery and acutely enough feared will be felt to be morally, if not literally, contagious.”

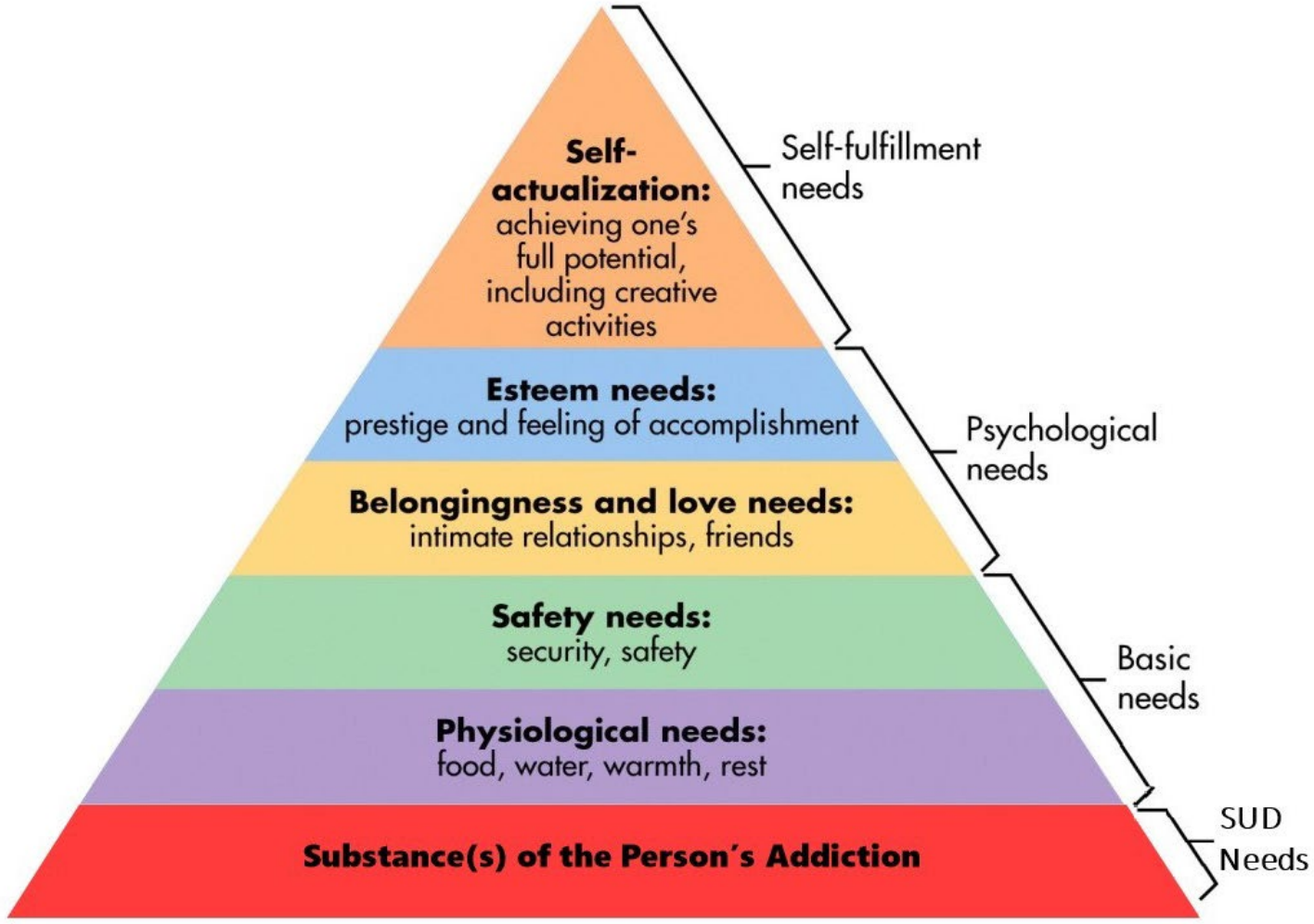
Susan Sontag, “Illness as Metaphor” 1978

Elements of Addiction

1. Compulsion & Craving
   A. Biological (Withdrawal)
   B. Conditioned Response
2. Loss Of Control Over Use
3. Continued Use Despite Adverse Consequences
4. Salience Of Use

DURATION of SYMPTOMS

Maslow's Hierarchy of Needs: As changed by addiction



Substance Use Disorders – DSM 5

- **Tolerance***
- **Withdrawal***
- **More use than intended**
- **Craving for the substance**
- **Unsuccessful efforts to cut down**
- **Spends excessive time in acquisition**
- **Activities given up because of use**
- **Uses despite negative effects**
- **Failure to fulfill major role obligations**
- **Recurrent use in hazardous situations**
- **Continued use despite consistent social or interpersonal problems**

Severity measured by number of symptoms:

2-3 Mild

4-6 Moderate

7-11 Severe

***not counted if prescribed by a physician**

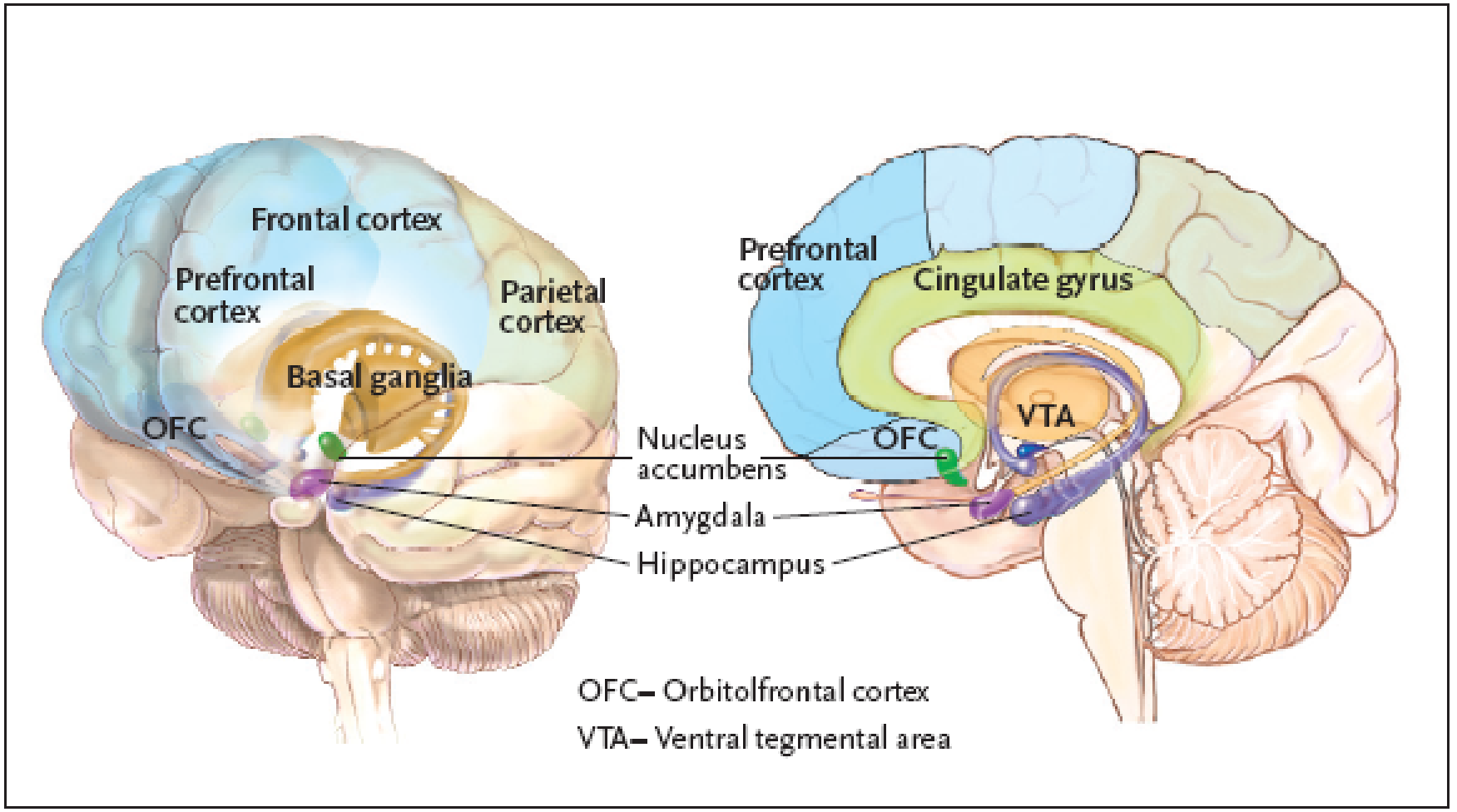
Source: American Psychiatric Association 2013

Theories on the Etiology of Addiction

- Drug Based (AGENT)
- User Based (HOST)
  - Psychological
  - Biological
- Environment Based

Basics of Pharmacology

Major Brain Regions with Roles in Addiction



The prefrontal cortex is the focal area for cognition and planning. The ventral tegmental area (VTA) and nucleus accumbens (NAc) are key components of the brain's reward system. The VTA, NAc, amygdala, and hippocampus are major components of the limbic system, which coordinates drives, emotions, and memories.

How Drugs Work

- Interact with neurochemistry
- Results:
  - ✓Feel Good – Euphoria/reward
  - ✓Feel Better – reduce negative feelings
- Final result – behavior persists

VARIABLES DETERMINING DRUG EFFECTS

- DOSE
- ROUTE OF ADMINISTRATION
- SET & SETTING
- OTHER DRUGS IN COMBINATION
- BIOCHEMICAL INDIVIDUALITY

Poll

Cannabis is in a drug classification by itself.

a. True
b. False

DRUG CLASSIFICATION

- CNS DEPRESSANTS
  - SEDATIVE-HYPNOTICS
    - ETHANOL, BARBITURATES, BENZODIAZEPINES, METHAQUALONE, VOLATILE INHALANTS, GHB
  - OPIATE ANALGESICS
    - MORPHINE, HEROIN, METHADONE, CODEINE, OXYCODONE, DEMEROL
- CNS STIMULANTS
    - COCAINE, AMPHETAMINE / METHAMPHETAMINE, METHYLPHENIDATE, NICOTINE, CAFFEINE
- HALLUCINOGENS
    - LSD, PSYLOCIBIN, MESCALINE, MDA / MDMA, PCP, KETAMINE
- CANNABIS - MARIJUANA & HASHISH

Cannabis

Cannabis circa 1937-1944 Demonization vs. Evidence

Most marijuana smokers are Negroes, Hispanics, jazz musicians, and entertainers. Their satanic music is driven by marijuana, and marijuana smoking by white women makes them want to seek sexual relations with Negroes, entertainers, and others. It is a drug that causes insanity, criminality, and death – the most violence-causing drug in the history of mankind.

Harry J. Anslinger, Head of Federal Bureau of Narcotics (FBN)
Testimony to U.S. House of Representatives Committee
(April 1937)

"Practice of smoking marijuana does not lead to addiction in the medical sense of the word" and that the drug was "not the determining factor in the commission of major crimes." Moreover, "the publicity concerning the catastrophic effects of marijuana is unfounded […] There [is] no direct relationship between the commission of crimes of violence and marihuana [... M]arihuana itself has no specific stimulant effect in regard to sexual desires" and that "use of marihuana does not lead to morphine or cocaine or heroin addiction."

NYC Mayor LaGuardia's Report
(1944

History of Marijuana in US

- 1854: listed in US Dispensary
- 1870: listed in US Pharmacopoeia
- 1915: outlawed in UT, CA, TX
- 1937: Marihuana Tax Act-$1/oz.
- 1941: removed from US Pharmacopoeia
- 1970: Controlled Substances Act
  - Placed in Schedule I = no medical use
- 1996: CA approves medical marijuana

Poll

What percentage of young adults who were not in college said they had vaped marijuana in the last 30 days (2019 data)?

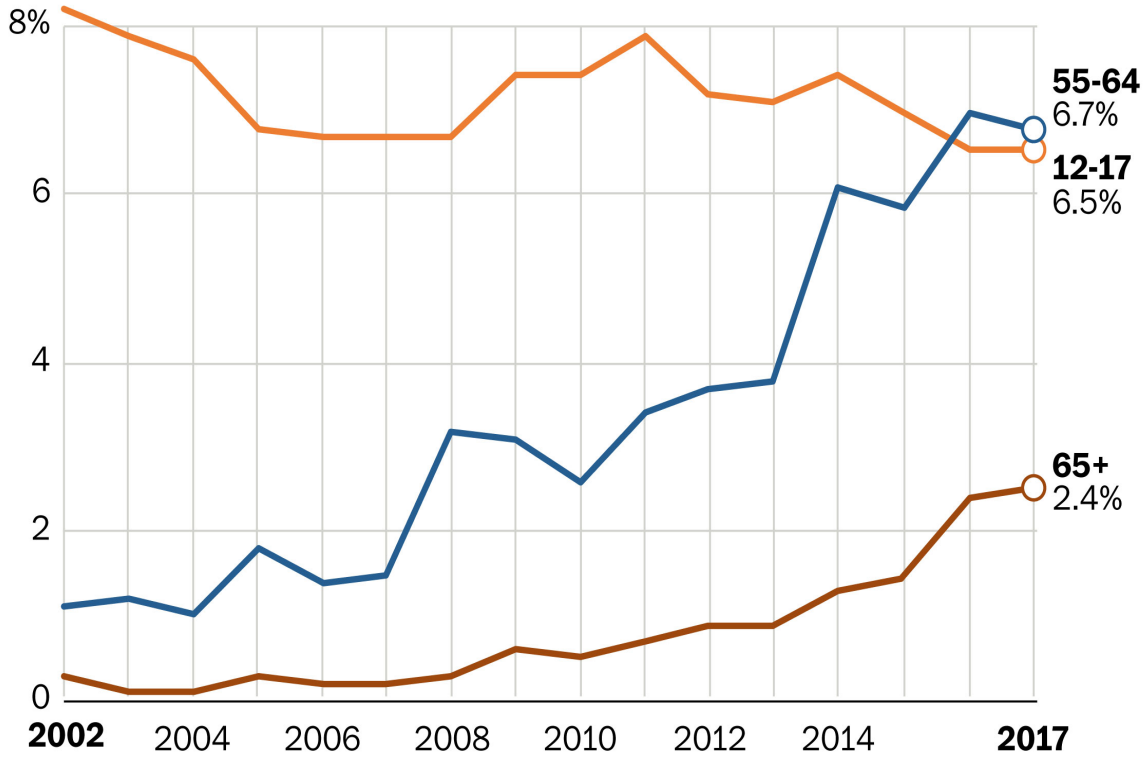
a. 5.2%
b. 7.8%
c. 14.0%
d. 17.0%

NIDA, Monitoring the Future 2019

Some Recent Trends in Use

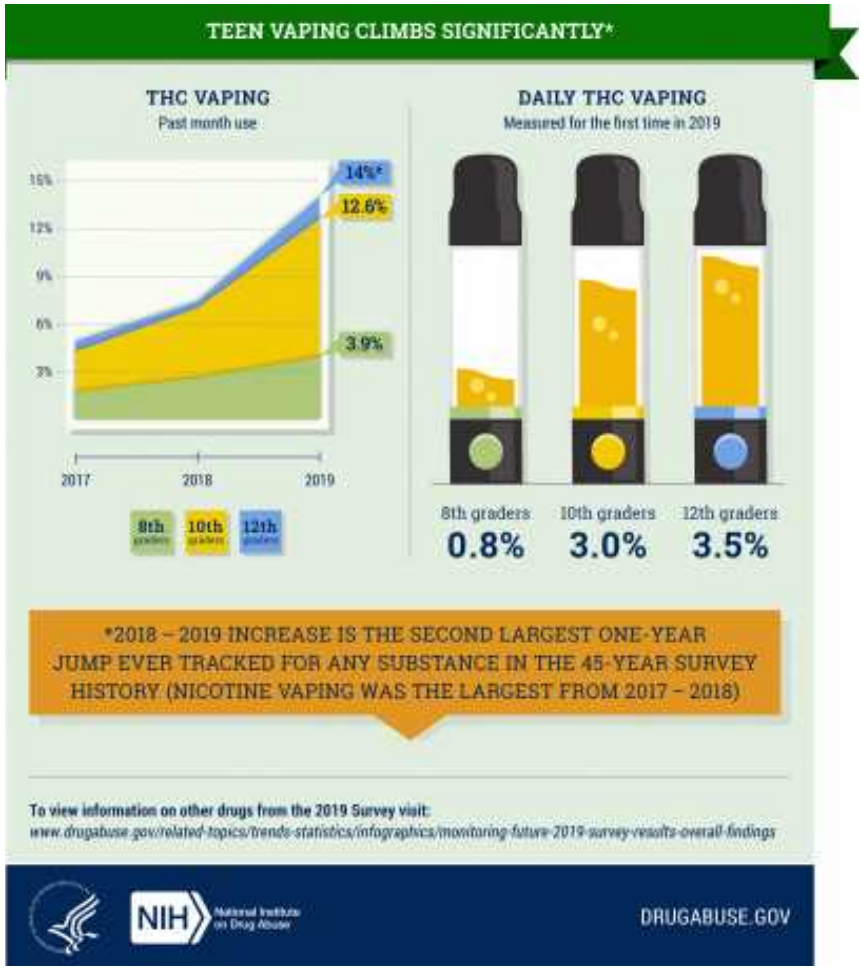
Rate of past-month marijuana use, by age

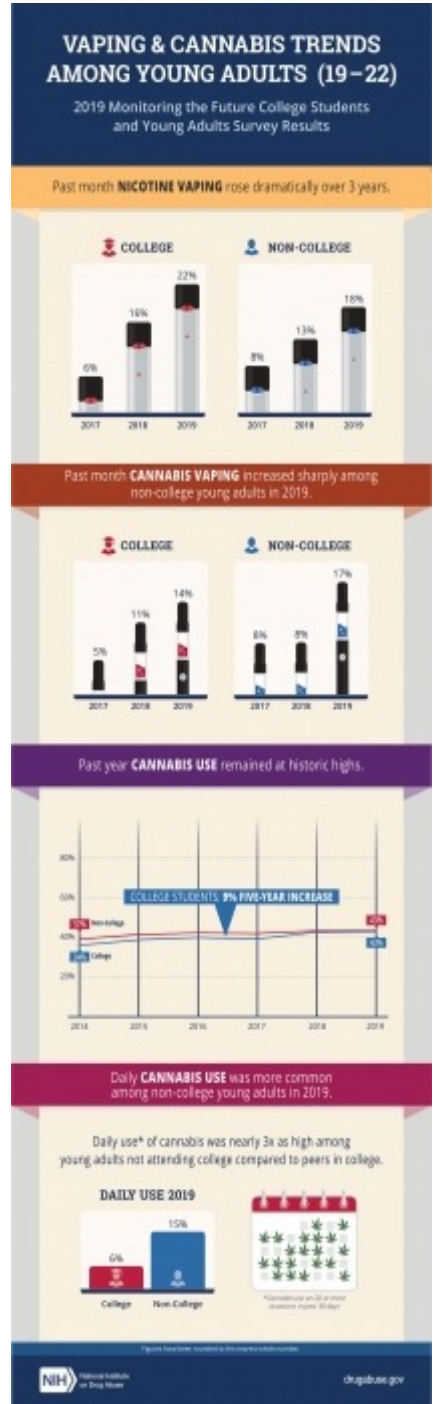
Percent of each age group reporting use of marijuana in the past month.



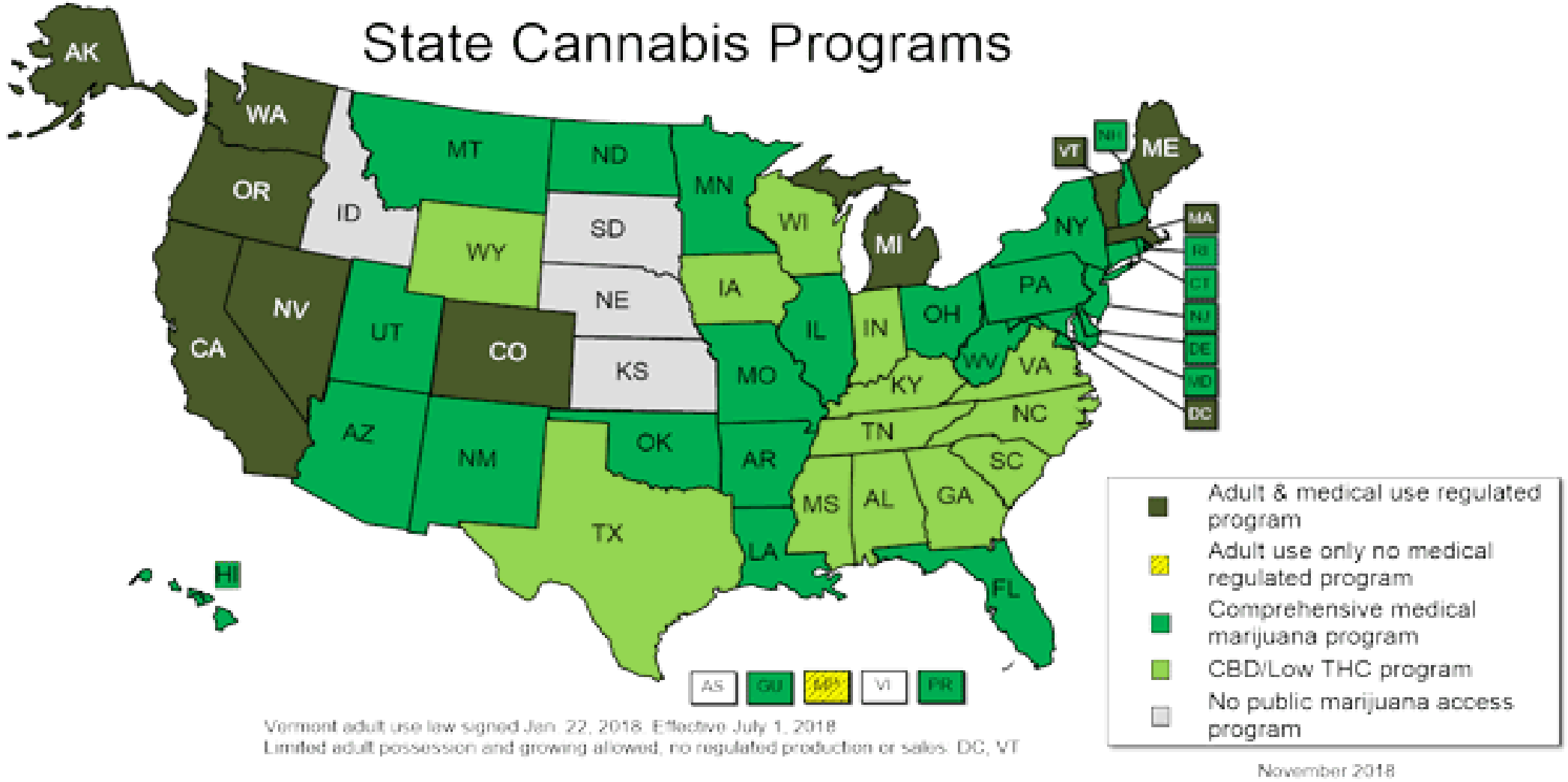
Source: SAMHSA, CDC

WAPO.ST/WONKBLOG





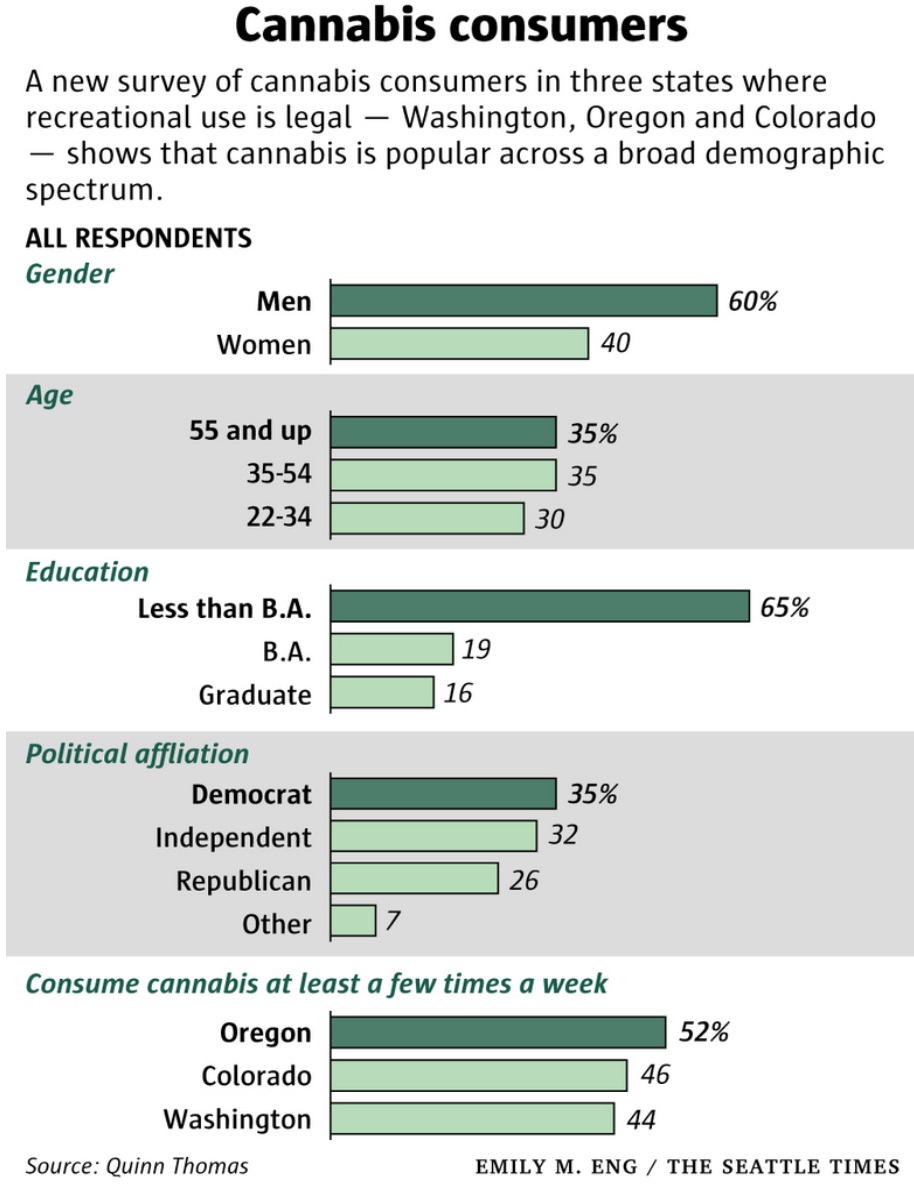
States



http://www.ncsl.org/research/health/state-medical-marijuana-laws.aspx

Cannabis has evolved

- Cannabis cultivators have crossed strains and produced many hybrids, varying the ratios of cannabinoids.
- Average THC content:
  - 1980: 2%
  - 1997: 4-5%
  - 2006: 8-9%
  - 2015: 5-25+%



Strains of Cannabis

MANY DIFFERENT STRAINS OF CANNABIS

STRAIN IS USED TO DIFFERENTIATE BETWEEN CANNABIS SATIVA AND INDICA. IT REFERS TO THE SPECIFIC BREEDOF EACH INDIVIDUAL PLANT. OVER THE YEARS, FAMILIAL STRAINS HAVE DIVIDED INTO SPECIFIC SUBSECTIONS.THOUGH STRAINS MAY LINAGE, THE DIFFERENCES ARE NUMEROUS

SATIVA STRAINS

Sativa strains have an uplifting effect and offera cerebral high that includes:

- Laughing uncontrollably
- Engaging in in-depth conversations
- Thinking creativity

Sativa strains grow tall and thin - the plant can grow up to 20 feet in an outside garden.Popular strains include:

AMNESIA HAZE

Relieved by morning users, it offers an uplifting boost.

CHERRY AK

With a sweet, fruity smell and taste, this strain can help alleviate a bad mood

GREEN CRACK

Users are rewarded with a blast of stimulated energy.

SOUR DIESEL

Despite a diesel smell, this strain offers a like Highland happiness, euphoria.

INDICA STRAINS

Indica strains have a relaxing, sedative effect, often used to:

- Reduce stress
- Relieve pain
- Limit anxiety

Indica strains are a bushy plantthat can grow between 3 and 6 feetall and are suitable for growing indoors. Popular strains include:

BUBBA KUSH

With a coffee and chocolate taste, this strain has a heavy tranquilizing effect.

HERO.JUANA

To battle insomnia, this strain induces a heavy, relaxing sleep.

NORTHERN LIGHTS

This pure indica is known to have come from the "medicine plant."

SKYWALKER OG

This strain is known for its healing properties for those with PTSD.

HYBRID STRAINS

Hybrid strains offer a mix of effects, combining the traits they inherited from their parent strains. Hybrids are known to:

- offer a relaxing body effect
- Create balance of mind and body
- Limit anxiety

Of the roughly 779 strains, over half of them are hybrids. Popular strains include:

BLUE DREAM

Offers a total relaxation while energizing the mind.

GIRL SCOUT COOKIES

This strain, a sweet and tasty version of Blue Dream, is go easy!

HEADBAND

Great for pain relief and a feeling of elation

PINEAPPLE EXPRESS

This sweet, tropical strain leaves one feeling happy and euphoric.

Major cannabinoids found in cannabis and putative effects

- Delta-9-tetrahydrocannabinol (THC): most psychoactive, lesser therapeutic
- Cannabidiol (CBD): analgesia; anti-convulsant; moderates effects of THC
- Cannabinol (CBN): sedative; anticonvulsant
- Tetrahydrocannabivarin (THCV): anti-inflammatory
- Cannabichromene (CBC): mixed effects
- Cannabicyclol (CBL): analgesic
- Plus 80-100 other cannabinoids

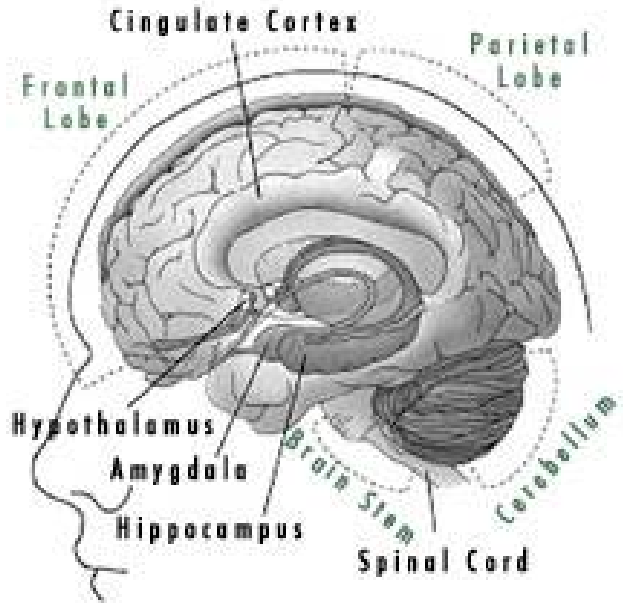
Terpenes – smell/flavor of cannabis

The Endocannabioid System

- Two types of cannabinoid receptors – CB1 & CB2
  - ✓CB1 – involved in motivation and cognition
  - ✓CB2 – involved in immune response
- Endocannabinoids:
  - ✓anandamide and 2-arachidonoyl glycerol (2-AG)
  - ✓Both are short-acting
  - ✓“Entourage” effect

Mechoulam, R & Parker, LA, The Endocannabinoid System and the Brain, *Annual Review of Psychology*, 64: 21-47, 2013

Effects on the Brain
Abundant Cannabinoid Receptors



Brain Region	Functions
Cerebellum	body movement, coordination
Hippocampus	learning and memory
Cerebral Cortex	higher cognitive functions
Nucleus Accumbens	reward
Basal Ganglia	movement control

Acute Effects

- Depends on:
  - Concentration of THC and other cannabinoids
  - Strain of cannabis – Sativa, Indica, Hybrid
  - Route of Administration
  - Set & Setting of user
  - Tolerance to THC
  - Other drugs in user's system
- <u>Cardiovascular effects</u>
  - Increase in heart rate
  - postural hypotension
- <u>Respiratory effects</u>
  - Bronchodilation

Acute Effects

- Endocrine System
  - Depression of sperm production
  - Depression of sperm motility
  - Decrease in testosterone (males)
  - Decrease of certain hormones in women?
- Immune System
  - Suppression of various elements of the immune response system
  - Leads to decreased resistance to infection by viruses and bacteria
  - More research necessary to clarify action and effects

Acute Effects

- Mental & Behavioral
  - Increase sense of well-being - euphoria, “high”
  - Feelings of relaxation, disinhibition
  - Altered perception of time & distance
  - Slowed reaction time
  - Impaired motor coordination
  - Difficulty concentration
  - Impaired short-term memory
  - Impaired goal-directed mental activity
  - Panic reactions

Chronic Use Consequences

- Tolerance
- Respiratory system damage
  - Bronchitis & pharyngitis
  - Decreased vital lung capacity
- Cannabinoid hyperemesis syndrome
- Immune system suppression
- Cognitive impairment (how long for recovery?)
  - memory & attention
  - organization & integration of complex information
- Link to schizophrenia?

Cannabis Use & Psychosis

- **Vulnerability to Psychosis**
  - Increased risk (2X) for onset of psychotic symptoms, however a doubled rate is still low.
  - Worsening of existing psychotic conditions.
  - Unclear causal mechanism. Possibilities include:
    - **Association**: Psychosis and cannabis use caused by something else
    - **Early Release**:Pre-existing psychotic disorder is released early by cannabis.
    - **Direct Cause**: Cannabis directly produces psychosis.
    - **Secondary Use**:Cannabis may be a self-medication for early psychosis.

Griffith-Lendering, M. F., et al. (2013). "Cannabis use and vulnerability for psychosis in early adolescence--a TRAILS study." Addiction **108**(4): 733-740.

Gage SH, Hickman M, Zammit S. Association between cannabis and psychosis: epidemiologic evidence. *Biol Psychiatry* 2016; **79:** 549–56

Safer does NOT equal Safe
Cannabis & the Adolescent Brain

- **Brain Maturation**: The developing brain in adolescence may be particularly sensitive to environmental inputs such as drugs.
- **Cognitive Dysfunction:** Many studies, including…
  - Prospective New Zealand (Dunedin) Study (birth-to-38 years old)
    - Persistent use is correlated with decline in cognitive abilities
    - Decline greater for those who started cannabis use before age 18
    - Deficits persisted > 1 year for early users
- **Estimated Lifetime Addiction Risk:**
  ~09% of adults.
  ~17% for early-onset adolescents.

Cowley, D. (2013). "It's Not Benign: Cannabis, Cognition, and Psychosis." Journal Watch Psychiatry **14**(1).

Problems Associated with Marijuana

(MTP Study, 2000)

Feeling Bad or Guilty	90%
Low Energy Level	86%
Procrastination	86%
Memory loss	76%
Low productivity	75%
Low self-esteem/confidence	70%
Interpersonal	58%
Financial	49%
Family	44%

Cannabis

Withdrawal Symptoms

- Irritability
- Drug craving
- Changes in appetite
- Sleep problems
- Vivid dreams

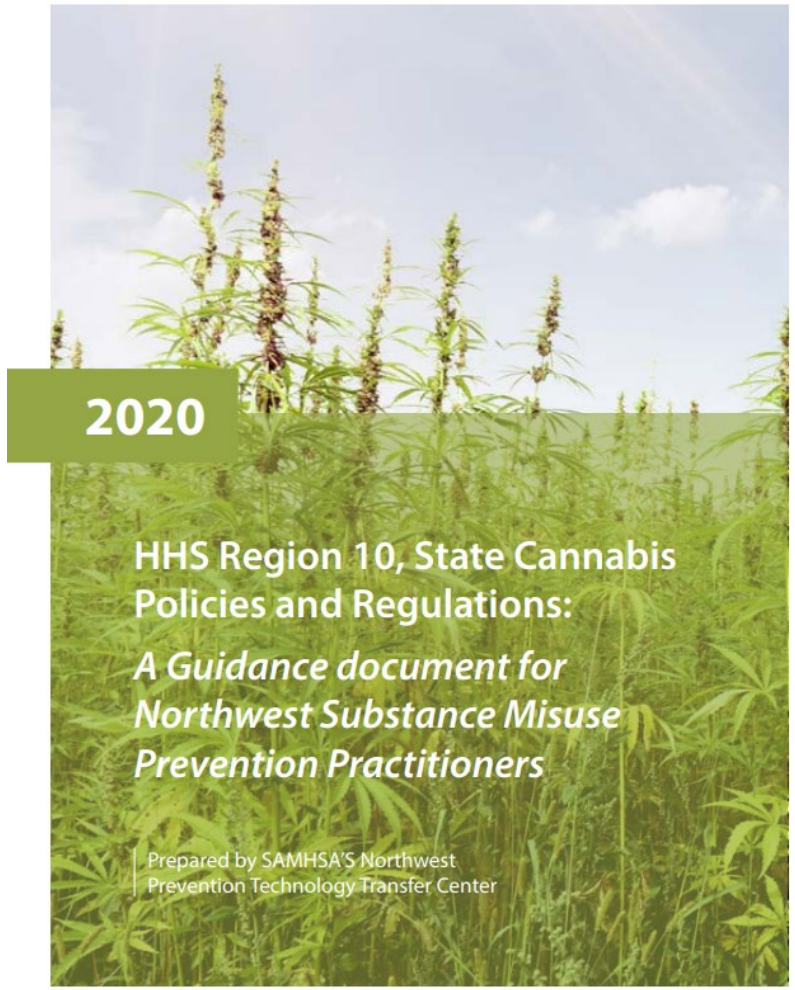
subtle onset and resolution of symptoms

Cannabis as Medicine

Therapeutic Targets

- ✓ Analgesia
- ✓ Neurological & gastrointestinal disorders
- ✓ Nausea and vomiting associated with cancer chemotherapy
- ✓ Appetite stimulation

Guidance Document



Key Elements

- Vocabulary
- History of legalization
- Regulatory structures and process
- The “5 Ps”
- Jurisdictional approaches and emerging issues
- Additional elements, e.g. social justice, economic empowerment, etc.
- Links to relevant resources
- Consideration of prevention funding

Chat

What are some cannabis prevention strategies that you are using in your communities?

References & Resources

- UW's Alcohol and Drug Abuse Institute (ADAI) Cannabis Research and Education: https://adai.uw.edu/research/cannabis-research-education/
- Learn about Marijuana: https://www.learnaboutmarijuanawa.org/
- SAMHSA Publications: https://store.samhsa.gov/?f[0]=substances:5444
- NIDA: https://www.drugabuse.gov/drug-topics/marijuana
- CDC: https://www.cdc.gov/marijuana/index.htm

We Need Your Feedback!

Please fill out the evaluation form!

The Link is in the CHAT

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Email: jporter@casat.org

Thank you!