Slide 1	Marijuana Misuse, Medicine, & Legalization Allan Barger, MSW	
Slide 2	Tackling Two Policy Issues Medical Marijuana Legalizing Marijuana	
Slide 3	Why Address Medical Marijuana Demographics Demand It Discussion Changes Perception of Risk Perception of Risk is Directly Linked: Use, Quantity and Frequency of Use Risk for Social Problems Risk for Health Problems	

Slide 4 Why Address Medical Marijuana These arguments have been persuasive ❖ Marijuana treats many illnesses . Many people do not respond well to traditional medicines Marijuana is as safe or safer than many prescription medications ❖ People are suffering It is unfair to make people suffer when marijuana can treat their condition. ❖The National Institute of Medicine (IOM) has endorsed the medical use of marijuana. Slide 5 Medical Marijuana INSTITUTE OF MEDICINE **Conditions of Use** 1. Short term use - less than six months duration 2. Reasonable expectation use improves symptoms 3. Documented failure of all approved medications 4. Treatment is done under ongoing medical 5. Physician routinely monitors treatment effectiveness Physicians refer to a review board, similar to an IRB, to provide guidance within 24 hours for a physician request to prescribe marijuana Marijuana and Medicine: Assessing the Science Base, 1999, IOM Slide 6 **Five Reasons to Address Medical** Marijuana To divorce medical and recreational use * To allow for compassionate medical use under IOM Guidelines To suggest we should not be doing drug approval by public referendum To teach the public to view medical marijuana as subject to diversion as any other prescription To teach the public if marijuana is a potent medicine, it has risks

Slide 7 Four Reasons to Legalize Marijuana 1. Alcohol is legal - marijuana should be too. 2. Marijuana is already so widely available, why not legalize it and get the tax revenue? 3. People are being unjustly imprisoned. 4. Tax Revenues will fill state coffers and alleviate state budget problems. Slide 8 1. Alcohol is legal - marijuana is no worse The False Analogy 1. Equating alcohol and marijuana effects a) Alcohol can be used as a beverage and usually b) Marijuana is used exclusively for getting high 2. There are statistically no differences in overall life outcomes among alcohol abstainers and drinkers who use low-risk 3. The real question is: "Is marijuana risky compared to not using at all?" Slide 9 2. It is already available - what's the difference? The False Assumption Confuses availability with

Slide 10	3. People are being imprisoned unjustly	
	Inmates in state prison for marijuana offenses (1997) • Drug possession offenses - 5.6% of all state inmates • First time drug offenders - 3.6% of all state inmates	
	Offenses involving marijuana - 2.7% of all state inmates Held for marijuana only - 1.6% of all state inmates Held for marijuana possession only -	
	o.7% of all state inmates First time offenders held only for marijuana possession (any amount) - O.3% of all state inmates Who's Really in Prison for Marijuana? - ONDCP	
	http://www.ncjrs.govlondcopubspoblicationspoli/whos.in.preson_for_manipallic Copyright(C) asso Prevention Research Institute All rights reserved.	
Slide 11	3. People are being imprisoned unjustly Marijuana offenders sentenced in federal courts (2002)	
	Drug offenders sentenced in federal court 24,299 Drug offenders sentenced for marijuana 7,991 Marijuana offenders sentenced for trafficking 7,805 (97.7%)	
	Marijuana offenders sentenced for possession 186 (2.3%) Marijuana offenders sentenced to prison for possession 63	
	Who's Really in Prison for Marijuana? - ONDCP http://www.ncjrs.gov/ondcppubs/publications/pdf/whos_in_prison_for_marij.pdf	
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Slide 12	4. Tax revenue will fill state coffers	
	The Argument > Less enforcement needed > Less spent on court costs	
	> Less spent on prison costs > Increased tax revenue	
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Cl: do 12		
Slide 13	4. Tax revenue will fill state coffers	
	• 90% in prison for drug	
	use are using cocaine, heroin, or meth.	
	• 6% for marijuana only	
	o.1%-o.2% total prison Authors' conclusion: population "decriminalization of	
	Most have other marijuana would have offenses, usually drug almost no impact on	
	trafficking, often with prison populations"	
	multiple drugs including some they do not use.	
	Caulkins, J., & Sevigny, E. (2005). How many people does the U.S. imprison for drug use,	
	and who are they? Contemporary Drug Problems;132, 405;4428-41	
Slide 14	4. Tax revenue will fill state coffers	
	Not the whole picture: > Competition will causes prices to plummet	
	> New bureaucracy, regulation & enforcement	
	>Enforce tax collection on a cottage industry?	
	> Organized Crime will not Disappear	
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Slide 15	4. Tax revenue will fill state coffers	
	Exploring legalization in California – Rand Drug Policy Institute estimated	
	legalization would create:	
	> a 25% increase in adult use	
	more new initiatesusing more frequently,	
	> using more requestry, > using in more settings,	
	> using for longer periods of time	
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Slide 16	4. Tax revenue will fill state coffers	
	This is likely to result in:	
	> More healthcare costs	
	 Including Treatment DUI costs likely to increase 	
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Slide 17		
Silde 17	4. Tax revenue will fill state coffers	
	Dutch Drug Information	
	System (LADIS) 1994 to 2002 (while overall numbers	
	remained numerically low) Increases in cannabis <i>only</i>	
	clients - Young clients (15-20) up 21%	
	Older clients (>20) up 96% Increases in	
	- cannabis + alcohol up 2.9%	
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Slide 18	Will Marijuana Pay Ita Pilla?	
	Will Marijuana Pay Its Bills? >In truth – no one knows	
	>Our history with alcohol and	
	tobacco suggests it won't	
	≻Even if it is financially profitable, there is a human and social cost	
	not counted in dollars	
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Slide 19	Cannabis Use – Five Risks 1. Acute Impairment 2. Lingering Effects 3. Psychosis 4. Dependence & Addiction 5. Life Outcomes	
Slide 20	Risk 1. Impairment "Getting high is just harmless fun and a great way to relax." Seed of Truth:	
Slide 21	Risk 1. Impairment Cannabis is the most commonly used illegal substance in DUI. DUI reports on adults 18 and older: 17,876,000 DUIs - with alcohol 13,124,000 DUIs - with cannabis (73,4% of all DUI other than alcohol) 2,900,000 DUIs - with cocaine (16,2% of all DUI other than alcohol) NOTE: Cocaine is the 2 rd largest drug using/driving group	

Risk 1. Impairment Impact of THC Impairment on Fatal Crashes Any level THC - 2.3 Increased odds of casing a fixal crash 2 s righth THC - 6.6 Increased odds of casing a fixal crash THC mostly impairs automated driving skills. Slide 23 Risk 1. Impairment Measuring THC Impairment to Complex State Per Se THC Impairment Levels None Any Illegal substance or metabolite in the blood (defined in state code) Per se THC levels ranging from 2 ng/ml - 20 ng/ml Any Illegal substance or metabolite in the blood (defined in state code) Per se THC levels ranging from 2 ng/ml - 20 ng/ml Slide 24 Risk 1. Impairment Research on Cannabis and Driving Past use of THC (24, hours earlier) - no effect on crash risks	Slide 22		
Any level THC - 6.6 increased odds of causing a fatal crash 2 s ragint THC - 6.6 increased odds of causing a fatal crash THC mostly impairs automated driving skills. Solide 23 Risk 1. Impairment	Silue 22	Risk 1. Impairment	
Any level THC - 6.6 increased odds of causing a fatal crash 2 s ragint THC - 6.6 increased odds of causing a fatal crash THC mostly impairs automated driving skills. Solide 23 Risk 1. Impairment		Impact of THC Impairment on Fatal Crashes	
Slide 23 Risk 1. Impairment Measuring THC Impairment is Complex State Per Se THC Impairment Levels None Any Illegal substance or metabolite in the blood (defined in state code) Per se THC levels ranging from 2 ng/ml – 30 ng/ml Slide 24 Risk 1. Impairment Research on Cannabis and Driving Past use of THC (24, hours earlier) – no effect on crash		Any level THC – 2.7 increased odds of causing a fatal crash	
Slide 23 Risk 1. Impairment Measuring THC Impairment is Complex State Per Se THC Impairment Levels None Any Illegal substance or metabolite in the blood (defined in state code) Per se THC levels ranging from 2 ng/ml – 10 ng/ml Supplies and the state code of the c			
Slide 23 Risk 1. Impairment Measuring THC Impairment is Complex State Per Se THC Impairment Levels None Any Illegal substance or metabolite in the blood (defined in state code) Per se THC levels ranging from 2 ng/ml – 20 ng/ml Any Company of the Company o			
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Research on Cannabis and Driving Past use of THC (24 hours earlier) – no effect on crash			
Research on Cannabis and Driving Past use of THC (24 hours earlier) – no effect on crash	Slide 24		
Past use of THC (24 hours earlier) – no effect on crash	Silde 2 !		
		risks	
Recent use of THC (past 2-4 hours) - increases risks for motor vehicle accidents			
THC alone at 2 ng/ml or higher alone increases risk			
Synergistic effect of alcohol & THC - greater impairment than either alone			
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Slide 25	Risk 1. Impairment	
	The New View	
	Those using cannabis do injure	
	themselves and others.	
	 Cannabis use decreases the ability to shift attention among multiple tasks. 	
	Cannabis use is not harmless.	
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Slide 26	Risk 2 – Lingering Effects	
	Nisk 2 – Liligering Litects	
	"It's better than alcohol. I don't have a	
	hangover; I get high, I come down.	
	Everything is fine."	
	Seed of Truth:	
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Cl:-l- 27		
Slide 27	Risk 2 – Lingering Effects	
	Multiple studies find deficits in:	
	Short-term memory Attention	
	Executive brain functions	
	• Planning	
	Organizing Focused attention	
	Persistence to task	
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Slide 28	Biolog Linearing Effects	
	Risk 2 – Lingering Effects	
	Do cannabis users do better at school or work while using? They may!	
	 Acute effect is decreased ability to shift attention, i.e. more focus on one thing. 	
	Rebound effect is decreased ability to focus on one thing while	
	not using, increasing the felt need to use to function. Rebound effect increases with duration of use.	
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Slide 29		
Silue 29	Risk 2 – Lingering Effects Summary The New View	
	Those using cannabis over time develop	
	subtle, but significant, cognitive problems.	
	 Cannabis use can increase attention problems as a rebound effect, 	
	increasing psychological dependence. • Marijuana is different from alcohol, but	
	that doesn't make it "safe."	
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Slide 30		
Silue 30	Risk 3 – Psychosis Disorder	
	"Marijuana doesn't cause real mental	
	health problems." Seed of Truth:	
	Seed of Iruth:	
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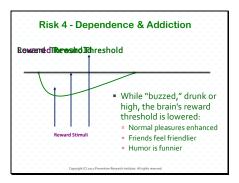
Slide 31		
Slide 31	Risk 3 – Psychosis Disorder	
	Is there a link between cannabis use, psychosis and subthreshold psychosis disorders?	
	Sostilicanou psychoso disorders.	
	Capyinght (C) 2022 Prevention Research Institute. All rights reserved.	
Slide 32		
Shac 32	Risk 3 – Psychosis Disorder	
	Studies show cannabis use linked to development of schizophrenia	
	Swedish conscript study (n=50,087 males) Cannabis use associated with dose-response curve	
	Persisted after controlling for stimulant use	
	Cannabis Use Dose-Response Curve and % Odds Ratios Developing Schizophrenia 5-10 times 1.1% Developed Schizophrenia	
	11-50 times 1.9% Developed Schizophrenia 2.2 increased odds > 50 times 3.8% Developed Schizophrenia 3.1 increased odds	
	Similar findings from other research Copyright (C) 2022 Prevention Research Institute. All rights reserved.	
Slide 33		
Shac 33	Risk 3 – Psychosis Disorder	
	Subthreshold psychosis can also be a problem:	
	Becoming more asocial	
	Loss of motivation/energy/concentration Drop in functioning	
	Increased suspicion and/or exaggerated beliefs	
	Odd behaviors	
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Slide 34			
	Risk 4 – Dependence & Addiction		
	"Cannabis is not addictive.	 	
	Or if it is, it's so mild it doesn't matter."		
	Seed of Truth:		
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Slide 35	Risk 4 - Dependence & Addiction	 	
	Is Marijuana Addictive?		
	> A New Understanding – Addiction is centered in brain	 	
	 Can marijuana use meet criteria for dependence and addiction? Withdrawal 	 	
	Loss of control		
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Slide 36	Risk 4 - Dependence & Addiction	 	
	What we do know: • Addiction is not just defined by physical dependence		
	Medical withdrawal does not lead to loss of control.	 	
	Withdrawal may play a role in continued use and relapse.		
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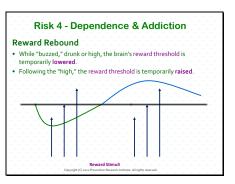
Slide 37	Risk 4 - Dependence & Addiction One View of Addiction: Same as DSM-IV Dependence > Tolerance • Need increased amounts or get diminished effect > Withdrawal • Typical substance withdrawal syndrome or • Substance or analog taken to relieve or avoid withdrawal > Using more or longer than intended > Desire or have unsuccessful efforts to cut down/control use > Spend a lot of time obtaining, using, or recovering > Decrease or give up important activities > Use continues despite knowledge of physical or psychological problems caused or made worse Copyright (Class) Prevention Paraerth Institute. All rights revered.		
Slide 38	Risk 4 - Dependence & Addiction 2nd View of Addiction: Homeostasis to Allostasis > High blood pressure is an allostatic state. > Drug-driven brain changes lead to addiction as the brain tries to maintain stability in the brain's reward systems. > Persistent vulnerability to relapse and addiction > Addiction is an allostatic state characterized by the - Compulsion to seek and take drug - Loss of control in limiting intake - Emergence of a negative emotional state when access is blocked		
Slide 39	Risk 4 - Dependence & Addiction Addiction - A New Understanding from the Latest Brain Research > group of behaviors arising from an altered brain > characterized by • A compulsion to seek and take drug • The loss of control in limiting intake • The emergence of a negative emotional state when access to the drug is blocked		

Slide 40 Risk 4 - Dependence & Addiction Neurobiological View of Addiction Slide 41 Risk 4 - Dependence & Addiction Lingering Deficits in Executive brain functions Planning Organizing Focused attention • Persistence to task Slide 42 Risk 4 - Dependence & Addiction

Slide 43



Slide 44



Slide 45

Risk 4 - Dependence & Addiction Reward Rebound • What we experience as euphoria, the brain and its neurons experience as a threat. • The brain responds to protect itself by making its reward system less sensitive to all reward. • This is the first reason we have a reward rebound – the brain is acting to protect itself.

Slide 46 Risk 4 - Dependence & Addiction The second reason for reward rebound is activation of the anti-reward system. Slide 47 Risk 4 - Dependence & Addiction Reward Rebound > Many anti-reward chemicals help moderate and shut down the > Loss of reward response leads to a: • Shift in values Shift in behaviors > Flip side of reward is stress. Slide 48 Risk 4 - Dependence & Addiction Stress Threshold A point at which we are not stressed, moving to the point where

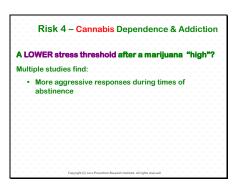
Slide 49 Risk 4 - Dependence & Addiction • Reward – During the early "high," the stress threshold is • Stress Threshold - As a drug leaves the system, the brain's stress set point is temporarily lowered. Slide 50 Risk 4 - Dependence & Addiction outcomes of these two chronic brain changes Slide 51 Risk 4 - Dependence & Addiction Altered Reward & Stress Systems > Loss of reward leads to a shift in values and behaviors Less rewarding = less valuable. Less rewarding = less time & energy invested > Small stressors: • have more power to trigger our stress responses

Slide 52		
onde 32	Risk 4 – Dependence & Addiction Altered Reward & Stress Systems >Leads to a shift in values and behaviors to	
	> avoid stress > seek reward	
	Cappinght (C) area it inventions between hindshide. All rights reserved.	
Slide 53	Risk 4 – Cannabis Dependence & Addiction	
Sinue 33	Does marijuana use acutely LOWER reward threshold (more pleasure)?	
	 Lowered reward threshold by Δ⁰-THC has been demonstrated by: Rate-frequency paradigm Reward-threshold paradigm 	
	 Similar to all other abused drugs Cannabis produces conditioned place preference in lab animals. Self-administration studies find both animals and humans 	
	will self administer cannabis. Cappople (C) 2023 Premittee Breanth-Indition. All rights searred.	
Slide 54	Risk 4 – Cannabis Dependence & Addiction	
	Does marijuana use acutely RAISE stress threshold (reduce stress)?	
	Multiple studies report: Cannabis stimulates the production and release of opioids, calming the brain and reducing pain	
	(emotional or physical). • Marijuana users state enhanced relaxation as the #1 reason they use.	
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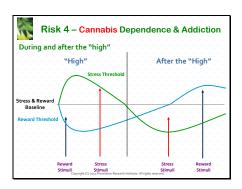
Slide 55

Risk 4 – Cannabis Dependence & Addiction A LOWER stress threshold after a marijuana "high"? Multiple studies report: Irritability (87%) Nervousness (80%) Depression (76%) Restlessness (76%) Anger (74%)

Slide 56



Slide 57



Slide 58		
	Risk 4 – Cannabis Dependence & Addiction	
	Let's explore the fourth and final criteria	
	Enhanced Stimulus- Response Links	
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Slide 59		
Sinde 33	Risk 4 – Cannabis Dependence & Addiction	
	Compared to non-users, cannabis users: More quickly focused on cannabis cues Spent more time looking at those cues	
	Rated the cues as more pleasurable Increased craving increased the stimulus response	
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Slide 60		
Silue 00	Risk 4 – Cannabis Dependence & Addiction Symptom prevalence in dependent cannabis users:	
	 Persistent desire 91%; Unintentional use 84%; Withdrawal 74%; 	
	 Excessive time obtaining/using 74%; Continued use despite health problems 63%; Tolerance 21%; Social consequences 18% 	
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Slide 61	Risk 4 – Cannabis Dependence & Addiction	
	Compared to Dependent Alcohol Users, Dependent	
	Cannabis Users reported: > Compulsive and out-of-control use more frequently	
	➤ Withdrawal similarly➤ Tolerance considerably less often	
	Proferance considerably less often	
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Slide 62	Risk 4 – Cannabis Dependence & Addiction	
	Most Powerful Predictive Risk Factor of	
	Dependency at Age 21	
	>Frequency of cannabis use at age 18	
	Even after controlling for pre-existing psychological or social factors	
	≻Nonusers who began use – 1.8 odds	
	>Odds nearly double at each level of use.	
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Slide 63		
Silue 03	Risk 4 – Cannabis Dependence & Addiction	
	Summary Marijuana has the ability to create:	
	Social dependence Psychological dependence	
	Physical dependence Behavioral Loss of Control	
	Marijuana is addictive, characterized by:	
	A compulsion to seek & take drug Loss of control in limiting intake	
	The emergence of a negative emotional state when access to the drug is blocked	
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