



Full length article

## Physicians-in-training are not prepared to prescribe medical marijuana

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### ABSTRACT

**Background:** While medical marijuana use is legal in more than half of U.S. states, evidence is limited about the preparation of physicians-in-training to prescribe medical marijuana. We asked whether current medical school and graduate medical educational training prepare physicians to prescribe medical marijuana.

**Methods:** We conducted a national survey of U.S. medical school curriculum deans, a similar survey of residents and fellows at Washington University in St. Louis, and a query of the Association of American Medical Colleges (AAMC) Curriculum Inventory database for keywords associated with medical marijuana.

**Results:** Surveys were obtained from 101 curriculum deans, and 258 residents and fellows. 145 schools were included in the curriculum search. The majority of deans (66.7%) reported that their graduates were not at all prepared to prescribe medical marijuana, and 25.0% reported that their graduates were not at all prepared to answer questions about medical marijuana. The vast majority of residents and fellows (89.5%) felt not at all prepared to prescribe medical marijuana, while 35.3% felt not at all prepared to answer questions, and 84.9% reported receiving no education in medical school or residency on medical marijuana. Finally, only 9% of medical school curriculums document in the AAMC Curriculum Inventory database content on medical marijuana.

**Conclusions:** Our study highlights a fundamental mismatch between the state-level legalization of medical marijuana and the lack of preparation of physicians-in-training to prescribe it. With even more states on the cusp of legalizing medical marijuana, physician training should adapt to encompass this new reality of medical practice.

## 1. Introduction

Medical marijuana has increasingly gained popularity as a treatment for diverse medical conditions including epilepsy, glaucoma, multiple sclerosis, post-traumatic stress disorder, and Crohn's Disease, as well as an alternative to opioids for treatment of pain (Federation of State Medical Boards, 2016; National Academies of Sciences, Engineering, and Medicine, 2017). Although federal law prohibits physicians from prescribing marijuana because of its classification as a Schedule 1 substance by the U.S. Drug Enforcement Administration, and thus defined as having no currently acceptable medical use and a high potential for abuse, marijuana has been legalized for medicinal purposes in 29 states and the District of Columbia, with additional states poised to make this change (National Academies of Sciences, Engineering, and Medicine, 2017; National Conference of State Legislatures, 2017; U.S. Food and Drug Administration, 2009). In most states where medical marijuana is legalized, medicinal users are

required to have documentation from a physician “prescribing” marijuana treatment for their medical condition. Because marijuana is prohibited to be prescribed on the federal level, these “prescriptions” are often called “recommendations” (National Conference of State Legislatures, 2017). We asked whether current training prepares physicians to answer questions and prescribe medical marijuana to their patients.

## 2. Methods

### 2.1. Measures

We analyzed three data sources: (1) survey of curriculum deans at United States medical schools; (2) survey of residents and fellows at Washington University in St. Louis School of Medicine; and (3) search of medical school curricula through the Curriculum Inventory.

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**Table 1**

Dean survey responses. Total, and stratified by legality of medical marijuana in the state where the dean's medical school is located.

		Total		Medical Marijuana Legal		Medical Marijuana Not Legal	
		N (101)	%	N (35)	%	N (66)	%
How prepared are your graduating students with answering patients' questions about medical marijuana?	Not at all	25	25.0%	6	17.1%	19	29.2%
	Slightly	51	51.0%	22	62.9%	29	44.6%
	Moderately	22	22.0%	7	20.0%	15	23.1%
	Very	2	2.0%	0	0.0%	2	3.1%
	Extremely	0	0.0%	0	0.0%	0	0.0%
How prepared are your graduating students with prescribing medical marijuana?	Not at all	66	66.7%	22	62.9%	44	68.8%
	Slightly	27	27.3%	11	31.4%	16	25.0%
	Moderately	4	4.0%	2	5.7%	2	3.1%
	Very	2	2.0%	0	0.0%	2	3.1%
	Extremely	0	0.0%	0	0.0%	0	0.0%
Do you believe medical marijuana should be a required part of the medical school core curriculum at your institution?	Strongly Disagree	2	2.0%	0	0.0%	2	3.1%
	Disagree	15	15.2%	4	11.8%	11	16.9%
	Neutral	34	34.3%	13	38.2%	21	32.3%
	Agree	44	44.4%	17	50.0%	27	41.5%
	Strongly Agree	4	4.0%	0	0.0%	4	6.2%

"Prefer not to answer" was an option for each question, which accounts for the variability in numbers of responses. Only 0–2 participants chose this answer for any given question.

### 2.1.1. Dean survey

We invited curriculum deans at allopathic (141) and osteopathic (31) medical schools in the United States to participate. The Institutional Review Board-approved survey included questions regarding how well prepared their graduating medical students were to prescribe medical marijuana. A survey link and a letter describing the study were emailed to each dean's primary address. Follow up emails and a hard copy follow up letter was sent to increase response rates. Questions in the survey included "How prepared are your graduating students with answering patients' questions about medical marijuana?" and "How prepared are your graduating students with prescribing medical marijuana?" with answer choices including "not at all", "slightly", "moderately", "very", and "extremely". The survey also asked, "Do you believe medical marijuana should be a required part of the medical school core curriculum at your institution?" with answer choices including "strongly disagree", "disagree", "neutral", "agree", "strongly agree". Surveys were completed from May to August 2016.

### 2.1.2. Resident and fellow survey

Residents and fellows at Washington University in St. Louis School of Medicine were invited to participate in our survey from March to June 2016. The graduate medical education office emailed the Institutional Review Board-approved survey to 1176 residents and fellows, and a reminder email was sent two weeks later to all initial survey recipients. Questions included, "How prepared are you with answering patients' questions about medical marijuana?", and "How prepared are you with prescribing medical marijuana?" with answer choices including "not at all", "slightly", "moderately", "very", and "extremely". The survey also asked, "Have you received any education about medical marijuana?", and "Do you believe education about medical marijuana should be required?" with answer choices including "no", "yes in medical school", "yes in residency or fellowship", and "yes in both". We also asked for the Accreditation Council for Graduate Medical Education specialty group of the participants – hospital-based, medical, or surgical.

### 2.1.3. Curriculum inventory report

The AAMC Curriculum Inventory contains curriculum content from participating U.S. medical schools, and includes course names, session titles, and learning objectives. We requested a custom report for academic year 2015–2016 to determine the number of schools that documented medical marijuana in their submitted curriculum content (Association of American Medical Colleges (AAMC)). Marijuana

keywords such as "Marijuana, Cannabis, Marihuana" were identified throughout the submitted curriculum information to find references to marijuana, and the keywords were used to find connected words such as "Legal; Medical; Therapeutics" to find curriculum artifacts related to medical marijuana. A review of the specific search results was then performed; and results that focused on marijuana addiction and hallucinogens were excluded.

### 2.2. Analysis

Comparisons between response options on the dean and resident surveys were made using two-tailed chi-squared tests on GraphPad Prism (7), collapsing groups (such as "strongly agree" and "agree" into one group) when cells had too few responses.

## 3. Results

### 3.1. Dean survey

101 curriculum deans responded to the survey (58.7% response rate), representing 82 allopathic and 19 osteopathic medical schools from 37 states and Puerto Rico. Twenty-five percent of deans reported that their graduates were not at all prepared to answer questions about medical marijuana, while 51.0% felt that their graduates were slightly prepared, and only 24.0% felt their graduates were moderately, very, or extremely prepared to answer questions (Table 1). Furthermore, most deans (66.7%) reported that their graduates were not at all prepared to prescribe medical marijuana, while 27.3% felt that they were slightly prepared, and only 6.0% felt that their graduates were moderately, very, or extremely prepared. Nearly half of deans (48.4%) agreed or strongly agreed that education about medical marijuana should be included in undergraduate medical education.

In states where medical marijuana was legal, 17.1% of deans reported that their graduates were not at all prepared to answer questions about medical marijuana, versus 29.2% of deans in states where medical marijuana was not legal. This difference, though large, was not statistically significant (Chi-square = 3.17, df = 2, p = 0.20). Other comparisons showed minimal differences between deans' responses in states where medical marijuana was legal vs. not legal (not at all prepared to prescribe: 62.9% vs. 68.8%; agree or strongly agree that education about medical marijuana should be included in the curriculum: 50.0% vs. 47.7%).

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