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Introduction

- The Medical Use of Marijuana Act effective in Florida in 2017 permitted the purchase and use of medical marijuana ¹
- Physicians that complete a required course are eligible to become authorized to order Medical Marijuana (MM) ²
- Limited evidence exists to compare if there are differences between authorized and unauthorized physicians for the prescribing practices

Objective: to describe physicians who are authorized to order MM by specialty, and to compare physician Medicare prescription measures by authorization status

Methods

1. Data Source and Study Population

Year	2017
Data Linkage (A with B)	A. The Florida registry of cannabis-authorized physicians B. The CMS Medicare Part D Prescriber Public Use File
Population	○ Authorized MM Physicians (successful linkage) ○ Unauthorized MM Physicians (unsuccessful linkage)

2. Outcome Measurement:

Compare the differences between authorized and unauthorized physicians by specialty

- Average total claims of opioid drugs
- Average total claims of long-acting opioid drugs
- Average total claims of brand-name drugs

3. Statistical Analyses:

- A total of 2,274 out of 2,678 records were successfully linked by the “fastLink” package in R

All statistical analyses were conducted in R 3.5.1

Results

- 2,274 authorized and 68,932 unauthorized MM physicians who filed at least one Medicare claim Florida in 2017
- Excluded not reporting any specialty with <11 physicians

Table 1. Average Total Claims of Opioid Drugs by Specialty with Authorized and Unauthorized Medical Marijuana Physicians in Florida

Specialty	Total Claims of Opioid Drugs, Including Refills	
	Authorized	Unauthorized
	Mean ± SE	Mean ± SE
Anesthesiology	1470.79±364.30	721.34±82.70
Cardiology	59.51±19.66	12.78±1.57
Emergency Medicine	85.14±10.17	66.03±2.09
Family Practice	190.82±17.00	155.13±4.10
General Practice	208.05±38.65	107.74±7.96
General Surgery	30.84±6.42	47.03±1.71
Hematology-Oncology	169.54±28.81	113.25±4.72
Internal Medicine	239.56±17.65	138.88±3.44
Interventional Pain Management	3283.53±374.03	2460.77±199.02
Neurology	417.06±160.01	124.94±22.2
Orthopedic Surgery	262.83±55.34	202.43±9.78
Pain Management	1748.47±286.16	1728.64±185.61
Physical Medicine and Rehabilitation	946.72±175.57	712.77±82.15
Psychiatry	13.63±4.74	3.68±0.82
Psychiatry & Neurology	24.13±14.47	2.26±1.15
Rheumatology	797.67±132.27	317.36±22.04
Urology	57.10±12.38	53.63±2.15

Table 2. Average Total Claims of Long-Acting Opioid Drugs by Specialty with Authorized and Unauthorized Medical Marijuana Physicians in Florida

Specialty	Total Claims of Long-Acting Opioid Drugs, Including Refills	
	Authorized	Unauthorized
	Mean ± SE	Mean ± SE
Anesthesiology	436.37±87.89	193.75±24.89
Cardiology	4.97±2.05	0.25±0.11
Emergency Medicine	4.51±2.32	1.10±0.53
Family Practice	25.22±4.48	12.5±0.73
General Practice	34.70±10.35	10.9±2.29
General Surgery	0.39±0.39	0.53±0.29
Hematology-Oncology	47.88±8.72	27.1±1.34
Internal Medicine	26.97±3.11	11.01±0.70
Interventional Pain Management	931.22±114.71	624.32±55.8
Neurology	93.95±35.05	22.37±4.80
Orthopedic Surgery	33.95±20.12	6.60±2.73
Pain Management	508.88±95.60	463.99±64.52
Physical Medicine and Rehabilitation	236.95±57.63	192.20±24.92
Psychiatry	2.27±1.48	0.35±0.15
Psychiatry & Neurology	7.28±5.34	0.41±0.35
Rheumatology	108.22±34.30	17.34±2.88
Urology	0.00±0.00	0.02±0.02

Table 3. Average Total Claims of Brand Name Drugs by Specialty with Authorized and Unauthorized Medical Marijuana Physicians in Florida

Specialty	Total Claims of Brand-Name Drugs, Including Refills	
	Authorized	Unauthorized
	Mean ± SE	Mean ± SE
Anesthesiology	219.86±54.17	87.33±11.16
Cardiology	600.59±139.77	525.35±17.17
Emergency Medicine	61.27±22.42	33.05±4.47
Family Practice	520.23±44.32	554.08±13.41
General Practice	571.34±90.17	582.82±30.63
General Surgery	44.58±17.09	16.30±2.65
Hematology-Oncology	162.46±37.19	132.28±6.45
Internal Medicine	820.45±52.22	586.85±11.30
Interventional Pain Management	470.54±69.27	338.42±36.03
Neurology	377.71±59.01	201.06±11.53
Orthopedic Surgery	44.10±13.38	23.19±2.52
Pain Management	290.06±49.45	226.99±37.04
Physical Medicine and Rehabilitation	131.67±21.94	121.30±19.45
Psychiatry	226.01±42.37	144.68±6.96
Psychiatry & Neurology	56.85±33.36	42.35±5.50
Rheumatology	884.33±243.92	400.62±30.56
Urology	84.90±30.81	133.21±10.67

Discussion

- The first study to assess physician prescribing practices among medical marijuana physicians in Florida
- The specialties with the highest average opioid claims and long-acting opioid claims were interventional pain management, pain management, anesthesiology, physical medicine and rehabilitation and rheumatology
- After the Florida medical marijuana laws, the opioid overdose and related deaths have dramatically decreased, and MM were considered as a safer treatment for chronic conditions than prescription opioids ³⁻⁶

Conclusion

In Florida, authorized medical marijuana Physicians prescribed more opioids to Medicare patients than non-authorized physicians, while prescribing fewer brand name medications as compared with non-authorized.

Selected References

1. Klieger SB, Gutman A, Allen L, Pacula RL, Ibrahim JK, Burrell S. Mapping medical marijuana: state laws regulating patients, product safety, supply chains and dispensaries. 2017. *Addiction*. 2017;112(12):2206-2216.
2. Howell K, Washington A, Williams PM, Mathis AL, Luque JS. Medical Marijuana Policy Reform Reaches Florida: A Scoping Review. *Florida public health review*. 2019;16:128.
3. Phillips E, and J. Gazmararian. Implications of prescription drug monitoring and medical cannabis legislation on opioid overdose mortality. *Journal of opioid management*. 2017; 13(4): p. 229-239.
4. Bachhuber RA, et al. Medical cannabis laws and opioid analgesic overdose mortality in the United States, 1999-2010. *JAMA internal medicine*. 2014; 174(10): p. 1668-1673.
5. Bradford A, C, et al. Association between US state medical cannabis laws and opioid prescribing in the Medicare Part D population. *JAMA internal medicine*. 2018; 178(5): p. 667-672.
6. Wen H, and J.M. Hockenberry. Association of medical and adult-use marijuana laws with opioid prescribing for Medicaid enrollees. *JAMA internal medicine*. 2018; 178(5): p. 673-679.

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