

Implementation & Evaluation of Safe Opioid Prescribing Guidelines for Chronic Non-Cancer

Pain in Primary Care

Nicole Parsons MS AGPCNP-BC

Hampton Medical Care

Patricia Bruckenthal PhD, APRN-BC, FAAN

Stony Brook University School of Nursing

Corresponding Author: Nicole Parsons MS AGPCNP-BC

Address:

Phone:

Email:

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**Abstract:** Uptake of evidence-based guidelines varies among primary care providers when treating chronic non-cancer pain patients in managed primary care settings. This project aimed to determine the feasibility and compliance of the Centers for Disease Control and Prevention's (CDC) opioid guidelines by implementing and evaluating safe opioid prescribing practices for adults with chronic non-cancer pain in primary care. Post educational intervention analysis revealed an increase in offering an alternative to opioids, an increase in establishing measurable goals for pain and function, an increase in discussing risks and benefits of opioid therapy, and an increase in checking a patient's prescription monitoring drug programing. Initiating a patient agreement and opioid risk tool demonstrated to be effective with over 70% compliance among the providers. There was no difference post intervention with use of urine drug screens or avoiding concurrent benzodiazepine and opioid prescribing. Findings suggest that a brief educational intervention increased compliance with most of the recommendations of the CDC guidelines.

**Perspective:** This project implemented an evidence-based guideline for chronic non-cancer pain patients on opioid therapy in primary care. If fully utilized by primary care providers, long term it has the potential to decrease opioid misuse, diversion, addiction, and overdoses while concurrently providing patients with adequate pain management treatment.

**Key Words:** *Chronic non-cancer pain, Opioid therapy, Guideline, CDC, Primary care*

## Introduction

Chronic noncancer pain (CNCP) is a major health problem in the United States. It is estimated that two-thirds of adult's experience pain longer than 5 years,<sup>4</sup> and 100 million Americans suffer daily from chronic pain.<sup>1</sup> Prescribing of opioid analgesics has increased significantly for the treatment of CNCP and has become common practice in the management of CNCP over the past 20 years. Prescriptions for opioid analgesics increased from 76 million to 207 million in the US between 1991 and 2013.<sup>11</sup> It is estimated that one out of five patients with non-cancer pain or pain-related diagnoses are prescribed opioids in office-based settings. Primary care providers account for a significant percentage of opioid prescribers.<sup>3</sup> This increase in opioid prescribing has played a role in the misuse, diversion, addiction and overdoses which has become a major public health problem in the United States.

Non-medical use of opioids is a growing problem in the United States, carrying high morbidity and mortality rates, and prescription opioids have played a role in this issue. In 2014, two million Americans were found to be abusing or addicted to prescription opioid pain medications.<sup>3,14</sup> According to the Centers for Disease Control and Prevention (2017), only 27% of opioid analgesics were obtained from legitimate prescriptions. In 2014, almost 19,000 Americans died of opioid analgesic overdoses, constituting to more than 52 individuals every day.<sup>3</sup> The misuse of opioid analgesics is a strong predictor of transition to heroin, which is cheaper and more readily accessible than prescription opioids.<sup>5</sup> In 2014 there was a noted increase of 145% cases of heroin use from 2007,<sup>2</sup> with a total staggering 914,000 heroin users.<sup>11</sup> Nearly 80 percent of heroin users reported using prescription opioids prior to heroin.<sup>12</sup>

Opioid analgesics do have a role in pain management for appropriately selected cases. Yet, there is lack of training and education in pain management, especially among primary care

physicians.<sup>7,9,10,12</sup> For example, one provider admitted to avoiding patients in his practice with complex conditions causing chronic pain due to a lack of training.<sup>7</sup> Several providers viewed opioid monitoring as a “law enforcement” activity, policing, or punishment for patients, and relying on their general impressions of risk for opioid misuse as a barrier.<sup>10</sup> Several studies demonstrated that even a moderate amount of education in this specialty was beneficial to primary care providers, as it provided more confidence in their prescribing and knowledge. A need to protect patients from opioid-related harms was deemed a facilitator, as was patients believing that opioid adherence monitoring, and ground rules were acceptable when they felt that their physicians had their best interest at hand.<sup>10</sup>

The Centers for Disease Control & Prevention opioid prescribing guidelines for CNCP were developed through a combination of systematic reviews, expert input along with a federal advisory committee. There are currently 12 recommendations (figure 1) which are “intended to improve communication between providers and patients about the risks and benefits of opioid therapy for chronic pain, improve the safety and effectiveness of pain treatment, and reduce the risks associated with long-term opioid therapy, including opioid use disorder and overdose”.<sup>3</sup> The objective of this quality improvement project was to develop and evaluate a practice based interventional educational program to improve primary care providers knowledge and compliance of safe opioid prescribing practices using the CDC guideline recommendations for chronic non-cancer pain patients in primary care. There is a gap between provider knowledge of evidence-based guidelines with actual practice and its effectiveness in opioid prescribing for chronic pain. This quality improvement project aims to address this gap by implementing all 12 guideline recommendations in a community based primary care practice.

Figure 1. 12 CDC Guideline recommendations for Prescribing Opioids for Chronic Pain

<p><b>Recommendation 1</b> Opioids are not first-line or routine therapy for chronic pain</p>	<p><b>Recommendation 2</b> Establish and measure goals for pain and function</p>	<p><b>Recommendation 3</b> Discuss benefits and risks and availability of nonopioid therapies with patient</p>	<p><b>Recommendation 4</b> Use immediate-release opioids when starting</p>
<p><b>Recommendation 5</b> Avoid dosages above <math>\geq 90</math> MME/day. Justify a rationale for titrating dosage to <math>\geq 90</math> MME/day</p>	<p><b>Recommendation 6</b> Prescribe lowest effective dose of Immediate release opioids for acute pain, and do not exceed 7 days</p>	<p><b>Recommendation 7</b> Follow-up and re-evaluate risk of harm; reduce dose or taper and discontinue if needed</p>	<p><b>Recommendation 8</b> Evaluate risk factors for opioid-related harms</p>
<p><b>Recommendation 9</b> Check PDMP for high dosages and prescriptions from other providers</p>	<p><b>Recommendation 10</b> Use urine drug testing to identify prescribed substances and undisclosed use</p>	<p><b>Recommendation 11</b> Avoid concurrent benzodiazepine and opioid prescribing</p>	<p><b>Recommendation 12</b> Arrange treatment for opioid use disorder if needed</p>

## Methods

### Conceptual Framework

The conceptual framework for this QI project was guided by the ACE Star Model of Knowledge Transformation. Converting evidence into practice through different stages of knowledge, it incorporates old and new concepts to improve care and includes the most reliable research and evidence summary to achieve the highest evidence-based practice for clinicians and patients.<sup>14</sup> There are five points on the ACE Star model, each representing important parts of knowledge transformation.; discovery, evidence summary, translation to guidelines, practice integration, and process outcome evaluation. These 5 points were applied to the implementation of this project. A discovery of the underutilization of an evidence-based approach to management of CNCP patients on chronic opioid therapy in the primary care setting prompted this QI project. The evidence summary gathered through a literature search of prior studies,

demonstrated several medical society and government agency guidelines for implementing evidence-based pain management practices for safe opioid prescribing. Translation to guidelines included the implementation phase through an educational intervention in-service for the staff and measuring the staff's understanding of the CDC recommendations, and the details of the project. Practice integration included implementation of the interventions with process outcome evaluated by provider compliance to each element of the recommendations, and the feasibility of the clinical guidelines.<sup>14</sup>

### **Setting and Participants**

Institutional review board was not required because this was deemed a quality improvement project and not a research project. The project was conducted in a suburban primary care practice located in the east end of Suffolk County NY. The practice consists of one medical doctor, three nurse practitioners, one physician assistant, and ancillary staff such as medical assistants and front desk personnel. The practice sees around 400 adult patients monthly, defined as 18 years and older for various chronic and acute conditions. The “target population” for this project consists of patients receiving chronic opioid therapy (COT) for at least 3 months with chronic non-cancer pain.

Three 30-minute educational in-services were conducted by the project leader for the providers and medical assistants to accommodate staff scheduling. Sessions discussed the opioid crisis, pain crisis, the 12 CDC guideline recommendations, and the goals of the quality improvement project. A demographic questionnaire was administered to the staff to complete and return to the project leader (Provider characteristics are detailed in Table 1). A pre and post knowledge test developed by the project leader was administered to the providers, and an evaluation survey at the end of the in-service was administered to assess providers satisfaction

and acceptability of the project. Both the pre & post-tests and survey asked 6 questions, and responses were based on a 1 to 5 Likert scale ranging from strongly disagree to strongly agree. The staff received a teaching tool guide outlining the 12 CDC guideline recommendations, as well as the providers and supportive staff's duties and responsibilities with carrying out the recommendations. A copy of the patient consent agreement adapted from the 2013 American Academy of Pain Medicine, and the opioid risk tool adapted from Webster & Webster,<sup>15</sup> were also distributed to the providers. A weekly text message was sent out to all the providers as a reminder and follow up of the interventions and importance of documentation.

### **Data Collection**

A data extraction tool (coded item checklist) to identify documentation of compliance to each of the 12 recommendations in the CDC guideline was created by the project leader. The project leader conducted chart reviews extracting data from patients de-identified electronic health records (EHR) on a weekly basis on chronic non-cancer pain patients receiving chronic opioid therapy.

### **Data Analyses**

All analyses were performed using SPSS. Through descriptive statistics, frequencies of the recommendations were analyzed and compared between preintervention and postintervention.

### **Results**

The primary care providers (N=5) were predominantly female, and primarily Caucasian. The predominant education level was master's prepared with a specialty in family practice. The employment status was equal among full-time and part-time. Their ages ranged from 26-60 years

old with a mean age of 44.6. Years in practice ranged from 0-25, with a mean average of 8 years, and all the providers reported no pain management training.

Table 1. Characteristics of Primary Care Providers (N=5)

Characteristic	
Age, Y	44.6 ±14.0
Years in practice	8.0 ± 9.9
Education	
Bachelor's degree	1(20)
Master's degree	3(60)
Medical Doctor	1(20)
Employment status	
Full time (40 or more hours/week)	2(40)
Part time (up to 39 hours/week)	2(40)
Self-employed	1(20)
Specialty	
Adult primary nurse practitioner	2(40)
Family practice	3(60)
Pain management training	
Yes	(0)
No	5(100)

Note: Values are mean ± standard deviation, or n (%)

There was a notable difference in the pre and post knowledge test results among the providers, demonstrating that the educational in-service was effective in explaining the details of the quality improvement project and its interventions. See Table 2.



Table 2. Providers Pre &amp; Post Knowledge Test (N=5)

Questionnaire	Pre-educational In-Service Test (n=5)		Post-educational In-Service Test (n=5)	
I recognize there is an opioid crisis	Strongly Agree:	4 (80)	Strongly Agree	5 (100)
	Agree:	1 (20)		
The 12 CDC recommendations are easily accessible online	Strongly Agree:	2 (40)	Strongly Agree	5 (100)
	Agree	1 (20)		
	Neutral	2 (40)		
I can identify all elements of the 12 recommendations	Strongly Agree	1 (20)	Strongly Agree	5 (100)
	Agree	1 (20)		
	Neutral	2 (40)		
	Disagree	1 (20)		
I recognize that reviewing a patient's PDMP for every controlled prescription is state mandated	Strongly Agree	5 (100)	Strongly Agree	5 (100)
Use of an opioid risk tool and urine drug screen can help indicate risk of opioid related harms	Strongly Agree	5 (100)	Strongly Agree	5 (100)
I am confident in my ability to apply all the recommendations for chronic non-cancer pain patient's on chronic opioid therapy	Strongly Agree	1 (20)	Strongly Agree	4 (80)
	Agree	2 (40)	Agree	1 (20)
	Neutral	2 (40)		

Note: Values are n (%)

### Guideline Compliance

A pre-intervention chart review of 20 charts was conducted to assess provider compliance to the CDC guideline recommendations prior to the educational in-service. Following the guideline implementation, a total of 65 charts were reviewed over a period of 5 months (September 2018 through February 2019). Refer to Table 3 for comparison of frequencies of provider compliance of the recommendations pre and post intervention.

Recommendation (1) offering an opioid alternative, compliance was 60% pre-intervention and 90.8% post intervention that resulted in a 30% increase. Recommendation (2) establishing and measuring goals for pain & function before starting opioid therapy, pre-intervention had a 15% compliance rate, post intervention an 81.5% compliance rate with an increase of 66.5%.

Recommendation (3) before starting & periodically discussing known risks and benefits of COT and patient/clinician responsibilities were discussed, compliance rate was 70% pre-intervention, and 95.4% post intervention, which resulted in a 25.4% increase compliance rate. A component of Recommendation (3) included initiating a patient agreement, outlining the benefits/risks and responsibilities for the patient and provider. Prior to the intervention, the primary care site did not have a patient agreement in place, this was considered not applicable. However, post-intervention with initiation of the patient agreement, there was a 76.9% uptake and use of the agreement by the providers.

Recommendation (7) evaluating benefits and harms within 1-4 weeks of starting opioid therapy for CNCP or for dose escalation and continued therapy, pre-intervention had a 65% compliance rate, a 93.8% post intervention compliance rate with an increase of 28.8%.

Recommendation (7a) When benefits do not outweigh the harms of COT, decreasing the opioid dosage MME/day by 10% of the original dose weekly or monthly until smallest dose is reached and eventually discontinued, pre-intervention had a 10% compliance rate of carrying out this intervention, 25% did not, and 65% were not applicable. Post-intervention had a 21.5% compliance rate of carrying out this intervention, 7.7% did not, and 70.8% were not applicable.

Recommendation (7b) If issues with decreasing dosages, coordinate with specialists and treatment experts as needed and refer to pain management. Pre-intervention had a 40% compliance rate implementing this intervention, and 60% did not. Post intervention had a 47.7%

compliance rate of implementation, a 46.2% rate of not implementing, and 6.2% that was not applicable. Recommendation (8) Before starting opioid therapy and periodically evaluating the risk factor of opioid related harms, an opioid risk tool was initiated for this recommendation. As with the patient agreement, the practice did not have a risk tool in place, therefore the pre-intervention phase was 0%. Post intervention had a 72.3% uptake of the opioid risk tool.

Recommendation (9) Checking a patient's prescription drug monitoring program (PDMP) for every opioid prescription, pre-intervention there was a 15% compliance rate, and post intervention a 52.3% compliance rate resulting in an increase of 37.3% compliance.

Recommendation (10) Obtain urine drug screen (UDS) before start of COT and annually, pre-intervention there was 20% compliance rate, and post-intervention 16.9% compliance, resulting in a decrease of 3.1% compliance rate.

Recommendation (11) Avoiding concurrent benzodiazepine and opioid prescribing whenever possible, pre-intervention 30% of the time providers did not avoid concurrent prescribing. Post-intervention, 29.2% of the time providers did not avoid concurrent prescribing, resulting in 0.8% decrease in compliance. Recommendation (11b) If taking benzodiazepines and opioids concurrently, was there a referral to a mental health professional to facilitate decreasing and discontinuing the benzodiazepine and finding an alternative. Pre-intervention 30% of the time providers did not provide a referral, post-intervention 26.2% of the time they did not provide a referral, and 3.1% of the time the providers did provide a referral post-intervention. Recommendation (12) If opioid use disorder is suspected, arrange for medication assisted treatment with suboxone or methadone with behavioral therapies. Pre-intervention, there were no cases requiring this type of treatment. Post-intervention, there was one case (1.5%).

Recommendation (4) when initiating opioid therapy, prescribe immediate-release opioids instead of ER/LA opioids, Recommendation (5) avoid dosages above  $\geq 90$  MME/day, and justify a rational for titrating dosage to  $\geq 90$  MME/day, Recommendation (6) prescribe lowest effective dose of immediate release opioids for acute pain, and do not exceed 7 days, and Recommendation (8b) when factors that increase risk for opioid overdose, offer Narcan; for these specific recommendations, both pre and post intervention, the primary outcomes had a 100% compliance rate.

Table 3. Provider Guideline Compliance

<b>Guideline Compliance Outcome of Interest</b>	<b>Responses</b>	<b>Pre-Intervention% adherence (N=20)</b>	<b>Post-Intervention% adherence (N=65)</b>
<b>R1.</b> Opioids are not first line or routine therapy for chronic pain	Yes Not Applicable	12 (60)	59 (90.8)
<b>R2.</b> Establish and measure goals for pain and function before starting opioid therapy	Yes Not Applicable	3 (15)	53 (81.5)
<b>R3.</b> Before starting & periodically (3 months) discuss known risks/benefits of opioid therapy & Pt/Clinician responsibilities	Yes Not Applicable	14 (70)	62 (95.4)
<b>R3 (b).</b> Patient agreement and consent outlining benefits/risks/responsibilities signed and scanned into chart once a year	Yes Not Applicable	20 (0)	50 (76.9)
<b>R7.</b> Evaluate benefits and harms with patients within 1 to 4 weeks of starting opioid therapy for chronic pain or of dose escalation and continued therapy. Evaluate these benefits and harms	Yes Not Applicable	13 (65)	61 (93.8)

every 3 months or more frequently.

<b>R7(a).</b> If benefits do not outweigh harms of continued therapy, decrease opioid dosage MME/day by 10% of the original dose per week or per month. Once smallest dose is reached, the interval between doses can be extended and opioids may be discontinued	Yes	2 (10)	14 (21.5)
	Not Applicable	13 (65)	46 (70.8)
<b>R7(b).</b> If issues with decreasing dosage, coordinate with specialists and treatment experts as needed and refer to pain management	Yes	8 (40)	31 (47.7)
	Not Applicable		4 (6.2)
<b>R8.</b> Before starting opioid therapy and periodically (every 3 months), evaluate risk factors for opioid related harms	Yes		47 (72.3)
	Not Applicable	20 (0)	
<b>(a). Initiate Opioid Risk Tool</b>			
<b>R9.</b> Check PDMP for every prescription	Yes	3 (15)	34 (52.3)
	Not Applicable		
<b>R10.</b> Obtain urine drug screen before start of opioid therapy and annually	Yes	4 (20)	11 (16.9)
	Not Applicable		
<b>R11.</b> Avoid concurrent benzodiazepine and opioid prescribing whenever possible.	No	6 (30)	19 (29.2)
	Yes		
	Not Applicable	14 (70)	46 (70.8)
<b>R11 (b).</b> If taking concurrently, refer patient to a mental health professional to facilitate decreasing & discontinuing the benzodiazepine	No	6 (30)	17 (26.2)
	Yes		2 (3.1)
	Not Applicable	14 (70)	46 (70.8)
<b>R12.</b> If opioid use disorder is suspected, arrange treatment for evidence-based treatment i.e. Suboxone, Methadone	Yes		1 (1.5)
	Not Applicable	20 (0)	64 (98.5)

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**Discussion**

This quality improvement project aimed to evaluate if compliance to safe opioid prescribing practices were achievable in a primary care setting for non-cancer pain patients on chronic opioid therapy after a brief educational intervention, and after implementation of the CDC clinical practice guidelines. The providers demonstrated compliance with offering an alternative to opioid therapy and establishing measurable goals for pain and function. There was an increase of discussing the known risks and benefits of opioid therapy, and a significant uptake in adapting the patient consent agreement, as well as the opioid risk assessment tool. There was also an increase of compliance noted post intervention among the providers with periodically checking for dose escalation and evaluation of harms and benefits for opioid management. There was not a significant difference with benefits not outweighing the harms of continued therapy, decreasing the opioid dosages by 10% or even discontinuing when harms were revealed. This was not an issue in this practice because many cases were not applicable to this intervention. There was not a lot of cases where decreasing dosages was an issue. When harms were identified and issues arose in decreasing and discontinuing a patient's COT, providers referred patients to pain management both pre and post intervention, resulting in no difference.

Providers were noncompliant with checking patient's PDMP prior to prescribing a pain medication. Although there was an increase post intervention, the compliance rate was only 52%. A PDMP is a statewide electronic database which collects, manages, and analyzes data on controlled prescriptions dispensed in a specific state. It can be used to address prescription drug diversion and abuse, drug epidemic early warning system, help prescribers avoid drug interactions and identify drug-seeking behaviors or "doctor shopping".<sup>6</sup> Studies show PDMPs are effective when fully utilized. It was demonstrated that 46.7% of clinicians did not realize

they could use it, and that most times users only accessed the PDMP when diversion, abuse, or addiction was suspected.<sup>8</sup> In New York state it is mandated that when prescribing controlled prescriptions, a provider must check a patient's PDMP. It was noted that a few providers stated that they had forgotten to chart that a PDMP was checked on their patient, or they forgot to check altogether. Obtaining urinary drug screens also failed to meet high thresholds, and the compliance decreased post intervention. One provider explained, that they did not have enough time to obtain a UDS on their patients, as their time is limited during visits. Another provider reported sometimes forgetting to obtain a UDS during regular visits.

Concurrent benzodiazepine and opioid prescribing demonstrated that providers did not set forth a strong effort of avoiding prescribing these medications or finding an alternative to benzodiazepines. Most patients were found to be resistant to discontinuing their benzodiazepines and found it difficult to consider stopping as they were fearful of not having adequate anxiolytics for their anxiety disorder. In return, providers did not have a substantial referral compliance rate to mental health specialists when their patient was concurrently taking opioids and benzodiazepines. There was only one case where opioid use disorder was discovered, and the provider intervened appropriately by starting the patient on a medication-assisted treatment.

The findings of this quality improvement project have important implications. These interventions can be implemented easily at a primary care practice where chronic opioid therapy is offered. The CDC has provided guideline recommendations for all primary care providers to use within their practices, and they are easily accessible online. A brief educational in-service increased providers knowledge on evidence-based practice guidelines, and improved compliance with these guidelines. The providers were able to effectively and safely prescribe opioid therapy for their chronic non-cancer pain patients. The concurrent prescribing of benzodiazepines and

opioids indicate a need for reinforcement teaching on risks of concurrent use and behavioral health interventions. The decrease in urine drug screen compliance suggests further evaluation of the system of UDS collection within this primary care practice. Given these findings, a potential solution would be creating templates within a patients EHR that would prompt a provider to check the PDMP, obtain UDS, implement ORT and patient agreement. These templates would be able to be used to monitor and rate the providers compliance to the clinical guidelines. Quarterly re-training of these guidelines during staff meetings, or review of workflow issues related to implementing guidelines could also reinforce greater compliance.

It is important to recognize the limitations of this quality improvement project. First, there was a small sample size of providers. The pre-intervention chart review sample size was small and cannot provide a statistically significant analysis to compare with the post intervention chart review. The study setting takes place in a suburban neighborhood primary care practice and may not reflect populations in urban or rural areas and may limit adoption by larger or smaller practices. The duration of the intervention was brief (5 months) causing inadequate time for a robust data collection. Another limitation was that some patients were being tapered off their COT and being placed on medical marijuana. This was not included as an interventional outcome, and therefore could not be compared to other COT patients.

## **Conclusion**

This QI project demonstrated that providing a brief educational intervention can help close the gap between knowledge of evidence-based guidelines and putting them into practice. This confirms that providing even a small amount of education can improve the way providers treat CNCP patients on COT. There is underutilization of the CDC guidelines in primary care practices, but with adequate educational training and re-training, the uptake of these clinical



guidelines will be improved. Improvements can be made within this study; however it showed a positive outcome of what implementing evidence-based guidelines into practice can accomplish.

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## References

1. The American Academy of Pain Medicine (2011). Retrieved November 26, 2017, from [http://www.painmed.org/patientcenter/facts\\_on\\_pain.aspx#burden](http://www.painmed.org/patientcenter/facts_on_pain.aspx#burden)
2. Center for Behavioral Health Statistics and Quality. (2015). Behavioral health trends in the United States: Results from the 2014 National Survey on Drug Use and Health (HHS Publication No. SMA 15-4927, NSDUH Series H-50). Retrieved March 11, 2018, from <http://www.samhsa.gov/data/>
3. Centers for Disease Control and Prevention (2017) Opioid overdose. Retrieved October 13, 2017 from <https://www.cdc.gov/drugoverdose/data/prescribing.html>
4. Chapman, C. R., Lipschitz, D. L., Angst, M. S., Chou, R., Denisco, R. C., Donaldson, G. W., Weisner, C. M. (2010). Opioid pharmacotherapy for chronic non-cancer pain in the United States: A research guideline for developing an evidence-base. *The Journal of Pain*, 11(9), 807-829. doi: 10.1016/j.jpain.2010.02.019154-163.
5. Davis, C. S., & Carr, D. (2016). Physician continuing education to reduce opioid misuse, abuse, and overdose: Many opportunities, few requirements. *Drug and Alcohol Dependence*, 163, 100-107. doi:10.1016/j.drugalcdep.2016.04.002
6. Fact sheet: Office of National Drug Control Policy. (2011). Retrieved November 18, 2017 from <https://www.ncjrs.gov/pdffiles1/ondcp/pdmp.pdf>
7. Harle, C. A., Bauer, S. E., Hoang, H. Q., Cook, R. L., Hurley, R. W., & Fillingim, R. B. (2015). Decision support for chronic pain care: How do primary care physicians

decide when to prescribe opioids? a qualitative study. *BMC Family Practice*, 16(1). doi:10.1186/s12875-015-0264-3

8. Irvine, J. M., Hallvik, S. E., Hildebran, C., Marino, M., Beran, T., & Deyo, R. A. (2014)

Who uses a prescription drug monitoring program and how? Insights from a statewide survey of Oregon clinicians. *The Journal of Pain*, 15(7), 747-755. doi:

10.1016/j.jpain.2014.04.003

9. Keller, C. E., Ashrafioun, L., Neumann, A. M., Klein, J. V., Fox, C. H., & Blondell, R. D.

(2012). Practices, perceptions, and concerns of primary care physicians about opioid dependence associated with the treatment of chronic pain. *Substance Abuse*, 33(2), 103-

113. doi:10.1080/08897077.2011.630944

10. Krebs, E. E., Bergman, A. A., Coffing, J. M., Campbell, S. R., Frankel, R. M., & Matthias,

M. S. (2014). Barriers to guideline-concordant opioid management in primary care-A qualitative study. *The Journal of Pain*, 15(11), 1148-1155.

doi:10.1016/j.jpain.2014.08.006

11. National Institute on Drug Abuse. (2014) America's addiction to opioids: Heroin and

Prescription Drug Abuse. Retrieved March 12, 2018, from

<https://www.drugabuse.gov/about-nida/legislative-activities/testimony-to-congress/2016/americas-addiction-to-opioids-heroin-prescription-drug-abuse>

12. National Institute on Drug Abuse (2018) Prescription opioid use is a risk factor for heroin

use. Retrieved May 1, 2019 from [https://www.drugabuse.gov/publications/research-reports/relationship-between-prescription-drug-heroin-abuse/prescription-opioid-](https://www.drugabuse.gov/publications/research-reports/relationship-between-prescription-drug-heroin-abuse/prescription-opioid-use-risk-factor-heroin-use)

[use-risk-factor-heroin-use](https://www.drugabuse.gov/publications/research-reports/relationship-between-prescription-drug-heroin-abuse/prescription-opioid-use-risk-factor-heroin-use)

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13. Spitz, A., Moore, A. A., Papaleontiou, M., Granieri, E., Turner, B. J., & Reid, M. C. (2011). Primary care providers perspective on prescribing opioids to older adults with chronic non-cancer pain: A qualitative study. *BMC Geriatrics, 11*(1). doi:10.1186/1471-2318-11-35
14. State of Texas, University of Texas Health Science Center at San Antonio. (n.d.). School of Health Professions, University of Texas Health Science Center at San Antonio. Retrieved November 22, 2017, from <http://nursing.uthscsa.edu/onrs/starmodel/star-model.asp>
15. Substance Abuse & Mental Health Services Administration. Substance use disorders (2015) Retrieved October 15, 2017, from <https://www.samhsa.gov/disorders/substance-use>
16. Lynn R. Webster, Rebecca M. Webster (2005). Predicting aberrant behaviors in opioid-treated patients: Preliminary validation of the opioid risk tool, *Pain Medicine, 6* (6) Issue 6, 432–442, <https://doi.org/10.1111/j.1526-4637.2005.00072.x>