# Opioid Management: Provider Education

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Abstract

Over the last two decades, opioid prescription and prevalence has increased to account for over 33,000 deaths per year (Soelberg, Brown, Du Vivier, Meyer & Ramachandran, 2017). This is not only due to overdose, but misuse, abuse, and addiction. The abrupt increase in prescriptions, pills dispensed, and opioid-related deaths have encouraged the involvement of multiple entities. In 2016, the opioid crisis gained the attention of communities that released guidelines to regulate prescription of opioid pain management. Such entities include the Center for Disease Control and Prevention (CDC), National Institute on Drug Abuse, Agency for Healthcare Research and Quality (AHRQ), Arizona Department of Health Services (AZDHS), and Substance Abuse and Mental Health Services Administration (SAMHSA). Evidence shows that prescribing practices between providers vary. It also shows that providers lack knowledge of appropriate opioid prescribing and management. To address this problem, provider education on an opioid policy is the most effective way to uniform opioid prescribing.

*Keywords: opioid management, opioid prescribing, prescribing providers, opioid policy*

# Opioid Management: Provider Education

Opioid abuse, misuse, addiction and overdose have been gradually rising since the 1990's until 2015 when drug overdose was the leading cause of accidental death in the United States (ASAM, 2016). This number comes not only from the misuse, but the inappropriate prescribing of opioids from providers that lack the knowledge and comfort in these medications. This allows for over prescription of opioids, improper disposal, and incomplete follow up from the provider. The AZDHS addressed all these inconsistences by administering a new policy outlining prescribing guidelines (2018). Therefore, adherence to a clinic-specific policy, following the AZDHS guidelines, will increase provider comfort and knowledge in prescribing opioids thereby reducing the number of inappropriate prescriptions.

## Background

The opioid crisis has been addressed multiple times in recent years. In October of 2017, *The Federal Response to the Opioid Crisis* discussed two problems leading to the opioid crisis; the rise in opioid analgesic prescriptions since the 1990's, and the lack of healthcare providers that are properly educated by evidence and trained to engage patients in a medication-assisted treatment (MAT) to the full capacity. For example, SAMHSA and the CDC have programs that center around educating the public and providers on the opioid crisis and necessity for opioid management. SAMHSA requires specialized training or board certification from Addiction Medicine or Addiction Psychiatry before prescribing buprenorphine, which has been shown to be an effective long-term treatment option for opioid dependence ("The prescription opioid," 2011). The CDC provides resources and training on opioid prescriptions through two programs; Prescription Drug Overdose: Prevention for States and Data-Driven Prevention Initiative (DDPI) and Prescription Drug Monitoring Programs (PDMP) (2018). These include education on

insurance practices for opioid prescribing, policies, and laws, such as naloxone administration, and Good Samaritan laws.

SAMHSA currently funds states with $11 million to train providers on opioid overdose ("The Federal response," 2017). The "Opioid Overdose Prevention Toolkit" was released in 2013 and can be used by people of the community and family members, along with trained professionals. It focuses on five steps which are: call for help, checks for signs of opioid overdose, support the person's breathing, administer naloxone, and monitor the person's response ("Opioid overdose prevention", 2016). More recently, $46 million in grants were awarded to help fund 22 states in training individuals that work with communities at high risk for opioid overdose.

The CDC emphasizes the importance of distinguishing the difference between acute and chronic pain, and pain that can be treated with opioids verses pain that can be treated with other pain management strategies ("Guideline for prescribing," 2017). Prescribing non-pharmacological pain management options should be the first treatment approach. This may include physical therapy, massage, or acupuncture. Next, medication treatment consists of non-steroid anti-inflammatories and steroid injections. Obtainable pain management goals should be mutually established by the patient and provider. The CDC recommends using immediate-release opioids first- beginning with a low dose and going slow with increasing the dose as needed ("CDC guideline," 2016). This recommended protocol should be discussed with the patient when the pain management goals are set. If indicated for acute pain, opioids should be restricted to 3-5 days with a limited quantity. Follow-up is then recommended to reassess pain management needs. An informed consent, instead of a pain contract is recommended to all patients that are being prescribed an opioid analgesic ("AZ opioid prescribing guidelines", 2018). The informed

consent should discuss the side effects, risk factors for opioid addiction, other medication contraindications and dose escalation for opioid prescribing. Providers and patients should discuss chronic pain management options beyond the 5-day prescription limit ("CDC guideline," 2016). Chronic pain management follow-up is recommended every 3 months, or more if needed. At this point, it is recommended the provider and patient discuss the benefits verses risks of continuing opioid therapy. The discussion will include the option of combining the therapy with other non-opioid pharmacological and non-pharmacological interventions. If it is determined to be necessary to increase the opioid dosage, providers should follow the guidelines carefully, increasing dosage to >= 50 morphine milligram equivalents (MME) per day and advise avoiding increasing dosage to >= 90 MME/day ("CDC guideline," 2016).

**Prevalence**

The necessity for opioid management has become prevalent because of the rising numbers in overdose, use, misuse, and over prescription of opioids. In 2012, 259 million prescriptions were written for opioids alone (ASAM, 2016). According to the CDC, there was a 30% increase in opioid overdoses from July 2016 to September 2017 ("Opioid overdoses treated," 2018). In addition, deaths from opioids have multiplied by five times since 1999. Arizona reports 6,369 suspected opioid overdoses with 996 ending in death and 629 cases of neonatal abstinence syndrome from June 15, 2017 to March 8, 2018 ("Opioid epidemic," 2018). Over half of these cases were in Maricopa county, followed by Pima County ("Opioid report," 2018). Death rates among men are more common than women, but that gap is closing. Methadone, Oxycodone and Hydrocodone are the most common drugs associated with overdose deaths ("Opioid report," 2018).

Overdose is not the only cause of these numbers. Addiction, misuse, abuse, and over prescription contribute to the opioid crisis ("Prescription opioid overdose data", 2017). Misuse is defined as using opioids without a prescription or using prescribed opioids through a different route or frequency than was prescribed. It also includes using it for the feeling or experience the drugs yield (Hoffman, Lewis, & Nixon, 2017). Because these numbers have grown so rapidly over recent years, many statements, policies and guidelines have been published to help providers when prescribing opioids for the original purpose of pain management. However, with multiple guidelines and recommendations, a single policy for providers at the same practice would be the most efficient way to ensure continuity of opioid management.

**PICO**

With the many published guidelines and recommendations on managing controlled prescriptions, providers often select the criteria that aligns with personal preferences. This can lead to inconsistencies in prescribing and managing opioids among prescribers in practice. At an outpatient primary care practice in Southeast Arizona, the 5 physicians and 1 physician assistant prescribe opioids based on personal prescribing preferences. There is no single policy or procedure in place for management of patients requiring opioid treatment. Each provider prescribes opioids using their own discretion. Therefore, several gaps in the process have been identified. This makes it difficult to manage patients' opioid prescriptions and in turn, acute and chronic pain. Typically, each provider has the patient sign a pain contract, along with an annual urine drug screen. The providers check the prescription drug monitoring program (PDMP) anywhere from monthly to yearly. The patients follow up as needed or as the provider sees fit. There is no reminder or tracking in the electronic medical record that indicates when the patient is due for refills, follow up appointments, urine drug screens. This leads to no reassessment of

opioid need and inadequate follow up of opioid pain management. Currently, with no policy or guidelines, there is no uniform compliance to opioid management. Therefore, the PICO question becomes: in healthcare providers prescribing opioids, how does education on an opioid management policy vs not, affect opioid management and policy compliance?

## Search Strategy

The initial search for this literature review included databases *Pubmed, Academic Search Premier, GoogleScholar, Lippincott Williams & Wilkins,* and *Guideline.gov.* Keywords that were used included; *provider education, opioid policy, opioid management* and *prescribing management.* The population was focused on providers with an outcome of opioid prescribing practices and the effect of opioid management programs. The term *opioid prescribing management* was used in *Pubmed* which yielded 1262 results (Appendix B, Table B1). This was narrowed down by selecting data that occurred in the last five years, while using the terms *integrated opioid dependence management* to narrow the criteria to opioid management programs that yielded 52 results (Appendix B, Table B2).

*Google Scholar* was searched using *palliative care opioid admission* which yielded 18,000 results (Appendix C, Table C1). The search was moved to *Academic Search Premier* using the terms *palliative care opioid management* under the criteria of being current within the last five years that yielded seven results (Appendix C, Table C2). *Academic Search Premier* was searched again using key terms *opioid policy* with no date restrictions, yielding 216 results (Appendix D, Table D1). This was narrowed down using the terms *chronic opioid policy* and restricting articles within the last five years that yielded five results (Appendix D, Table D2).

Several articles were chosen from the brief abstract and results, but then upon accessing the full article that was in Greek and German, they were discarded. Articles were chosen that are

in the English language only. After each article was chosen, a review of the references would be conducted. These referred to entities such as *Pain Medicine, CDC guidelines, National Institute on Drug Abuse, and Agency for Healthcare Research and Quality.* Articles were then chosen based on relevance to address the PICO question.

## Synthesis

The studies selected ranged from level II to IV evidence due to lack of a control group. Of the 10 studies chosen, three studies were cross-sectional with level IV evidence. Two were cohort studies of level IV evidence, and three randomized control trials of level I and II evidence. Finally, one study was a systematic review of level II evidence and one meta-analysis of level III evidence.

Six of the ten studies addressed screening tools for opioid management interventions such as the *Opioid Compliance Checklist* (OCC) and the *Screener and Opioid Assessment for Patients with Pain* (SOAPP) (Appendix E). Six of the articles addressed interventions for opioid management through clinic settings such as the opioid reassessment clinic (ORC) or multidisciplinary care (Appendix E). Five of the articles included interventions that had an opioid policy, opioid taper, or a tool to reduce inappropriate medications (TRIM) (Appendix E). Nine of the studies were conducted in the United States, with one being conducted in several clinics across France. Although conducted in two countries, the demographic homogeneity is present across all studies as the criteria to be in a study included taking prescribed opioid therapy and being over the age of 18 years old.

Two articles had potential for bias, as the authors were employed by the company funding and conducting the study. Besides that, all other studies were funded through government health agencies, with the addition of one pharmaceutical company. Two studies

showed attrition rates that were lower than 20% (Appendix E). All tools used across the studies reported reliability and validity.

From these interventions, there was a wide array of dependent variables measured. Frequent dependent variables utilized opioid use, patient satisfaction, patient follow-up, provider education, and total daily dose (TDD) of oral morphine equivalent (OME). Other variables included provider satisfaction, prediction of opioid abuse, medication reconciliation, and if the interventions took place in a primary care setting. The studies had a broad range of time from three months to two years. Many studies measured outcomes using self-report or self-questionnaires, along with comparing OME or TDD of opioids. The majority of the findings were statistically significant with a p value $<.05$. If the results were not shown to be statistically significant, the quality of evidence and findings were considered for future practice.

## Conclusion About the Evidence

Multidisciplinary care was the most common intervention across the studies. Primary care with a multidisciplinary approach had a consistent increase in patient satisfaction, patient follow-up, and decrease in opioid use. Patients in primary care had a greater success in opioid abstinence, follow-up and adherence to prescribed opioid therapy, decreasing chances of misuse. The two studies that initiated an opioid policy saw decrease in opioid use by mouth. However, there was an increase in overall opioid use, namely long acting opioids and opioids used by intravenous route (Appendix E). The ORC and opioid taper saw a decrease in opioid use. These two studies, along with one of the opioid policies saw a decrease in TDD of OME. Two studies addressed the need for provider education in not only prescribing and dosing, but also informing patients on proper disposal of opioids.

## Contribution of Theory

Bandura's theory of self-efficacy is applicable to the topic of opioid management and education (Bandura, 1977). Opioid management is often inconsistent, especially among primary care providers that may be unfamiliar with this territory. Through the theory of self-efficacy, it is shown that new information should be taught, demonstrated, then taught back to another person such as a patient (Smith, & Liehr, 2014). This would apply when implementing new opioid guidelines. This process helps the learner know that the task can be done and reinforces success. Bandura's theory focuses on interventions that change behavior, and in turn, change knowledge and clinical practice.

## Evidence Based Practice Model

The *Iowa Model of Evidence- Based Practice to Promote Quality Care* is the model to use when initiating a new protocol (Melnyk & Fineout-Overholt, 2015). It guides the user through the steps to start, research, initiate, and then evaluate a change in practice (Appendix F).

A primary care clinic has identified a need to establish an opioid use practice guideline to comply with the CDC and AZDHS guidelines (2018). A team of 5 family practice Medical Doctors (MD) and 1 Physician Assistant (PA) have agreed to participate in this project about these new guidelines. A PICO question was formed to search for the best evidence and practice for opioid prescribing. Evidenced-based prescribing guidelines, a pain algorithm and an informed consent derived from the AZDHS will be provided to the 6 prescribing providers. Ten articles were chosen, and then critically appraised to analyze the best evidence, outcomes, and practices in initiating an opioid policy. The measurement tool is a self-questionnaire that has been adapted from the Arizona Department of Health Services questionnaire. ("Arizona pain and addiction curriculum", 2019). The pre, post and 6-week follow-up questionnaire will include questions regarding provider knowledge and comfort in opioid prescribing, procedures in opioid

management, and frequency in prescribing, follow up, and referring to other pain management options. The next step is obtaining institutional review board approval.

## Brief Potential Plan

An opioid policy that includes evidenced-based prescribing guidelines, a pain algorithm and an informed consent derived from the AZDHS, will be provided to the 6 prescribing providers using the CDC and the 2018 AZ Opioid Prescribing Guidelines (2018). This will be presented in a PowerPoint presentation and handouts to the stakeholders in the primary care practice. The key stakeholders are 5 MDs and 1 PA in the private primary care clinic in Southeast Arizona. Additional stakeholders include medical assistants, office managers, and receptionists. A pre-questionnaire will be administered to the key stakeholders that measures the knowledge of providers in prescribing, management, and beliefs regarding opioids. For example, the self-questionnaire will include questions regarding knowledge and comfort in opioid prescribing, procedures in opioid management, and frequency in prescribing, follow up, and referring to other pain management options.

The policy guidelines in opioid prescribing and management will be presented through PowerPoint presentation and handouts. This will include the AZ Opioid Prescribing guidelines, CDC recommendations and other tools that can be utilized to manage opioid prescriptions (2018). The same self-questionnaire will be administered after the presentation to measure how education on the policy influenced views and practices on prescribing opioids. Another self-questionnaire will be administered after six weeks to measure the providers prescribing practices after education and implementation on the opioid management guidelines.

## Summary with Proposed Implications

An opioid policy can streamline management and prescription of opioids. The implementation of a policy will condense provider and clinic expectations to one uniform policy that can be followed by every member of the clinic, including the patients. Education would consist of clearly outlining the prescribing and management practices of the clinic. Education on opioid management guidelines, pain algorithm and informed consent reiterates prescribing restrictions produced by the CDC and AZDHS(2018). This will reduce the number of inappropriate prescriptions and decrease opioid abuse and misuse.

All providers in the clinic will have one policy to follow, making it efficient to manage opioid prescriptions and patients with pain in primary care. Every member of the healthcare team would be aware of the new guidelines, therefore taking a multidisciplinary care approach to management of opioids. This approach increases patient satisfaction, patient follow up, and adherence to opioid management programs.

## Results

The sample consisted of 2 (33%) females and 4 (66%) males. 1 (17%) of the participants was a Physician Assistant and 5 (83%) were Medical Doctors. The average years of clinical experience was 24.33 (SD=8.41).

There were two tests that were used. The Wilcoxon signed rank test was used for the 6 participants that completed the pre-questionnaire and post-questionnaire. The statistically significant result showed a decrease in the question “confidence that opioids are not effective for long-term chronic pain”, (p=.034). There was one clinically significant result showing an increase in the question “I know community resources to treat patients with pain and/or addiction”, (p=.071). The second test that was used measured 3 data collection times; pre-questionnaire, post-questionnaire and 6-week post-questionnaire. There were 4 participants that

completed all three questionnaires. There was one statistically significant result that showed an increase in the question "I am currently satisfied with my knowledge of managing patients with chronic pain", (p=.039).

## Discussion

Overall, the results showed an increase in provider knowledge and comfort in treating patients with pain. The results showed a decrease in provider confidence that opioids are not effective for long-term chronic pain. In other words, after the intervention, the providers had increased knowledge that opioids are not effective for long-term chronic pain. The results also showed that providers had increased satisfaction with their knowledge of managing patients with chronic pain. There also was an increase in providers' knowing community resources to treat patients with pain and addiction.

Barriers included the clinic's resistance to change and lack of time for project implementation. The attrition rate of 40% is attributed to lack of provider follow-up. Project sustainability is based on the provider and clinic willingness to adopt and continue using the prescribing guidelines. Current recommendations based off this project is to implement an opioid policy in all primary care clinics to include prescribing guidelines, pain algorithm and an informed consent.

## Conclusion

This project, utilizing the CDC and 2018 AZ Opioid Prescribing Guidelines, created a policy that included guidelines, a pain algorithm, and informed consent for the primary care providers ("Arizona opioid prescribing guidelines", 2018). All information was presented via PowerPoint and paper handouts. A pre, post and 6-week follow-up questionnaire included questions regarding provider knowledge and comfort in opioid prescribing, procedures in opioid

management, and frequency in prescribing, follow up, and referring to other pain management options. The data collected from the pre-questionnaire and post-questionnaires showed that there was an increase in provider knowledge and satisfaction when prescribing opioids after the intervention.

In summary, this project made the 2018 AZ Opioid Prescribing Guidelines into a useable, manageable set of guidelines that is easily applicable into a primary care practice.

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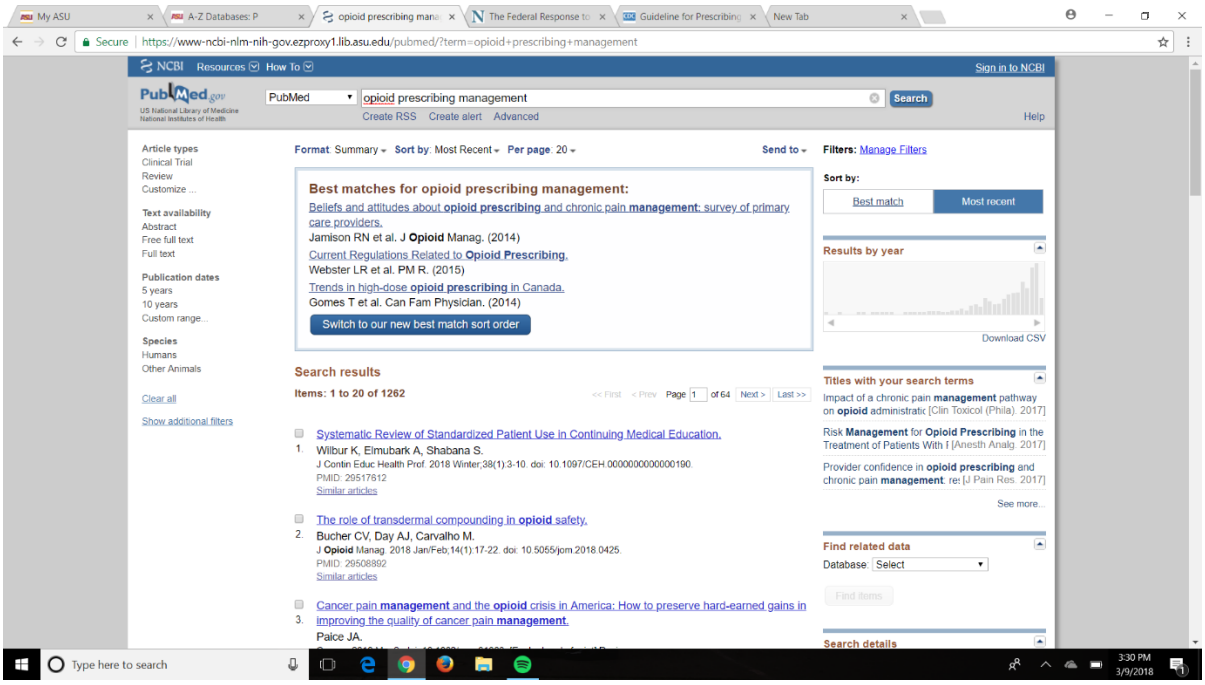
# Appendix A

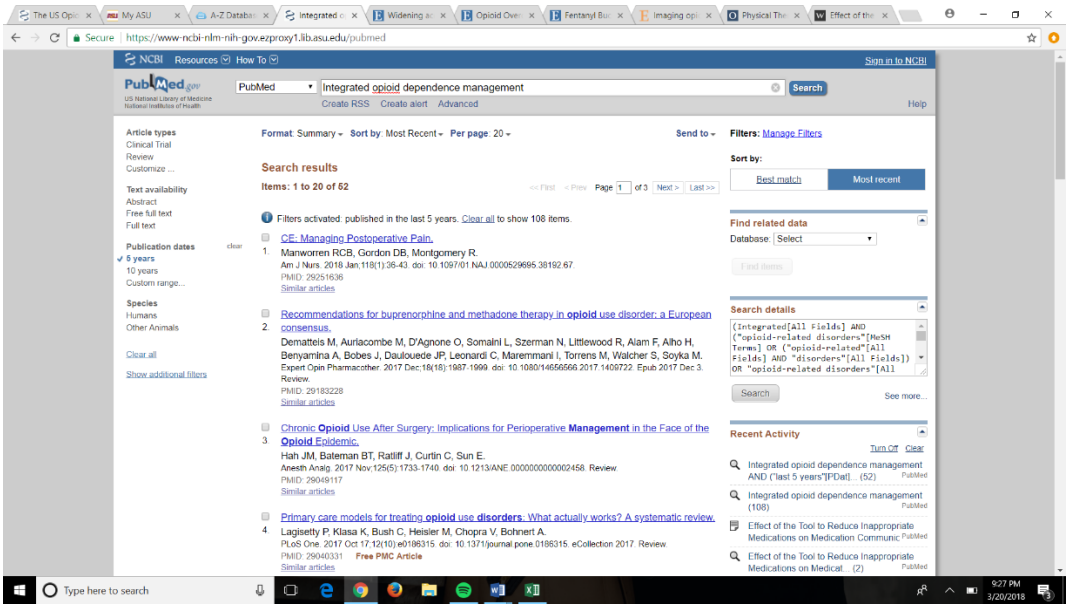
## Table A1

*PubMed Database Screenshot*




## Table A2

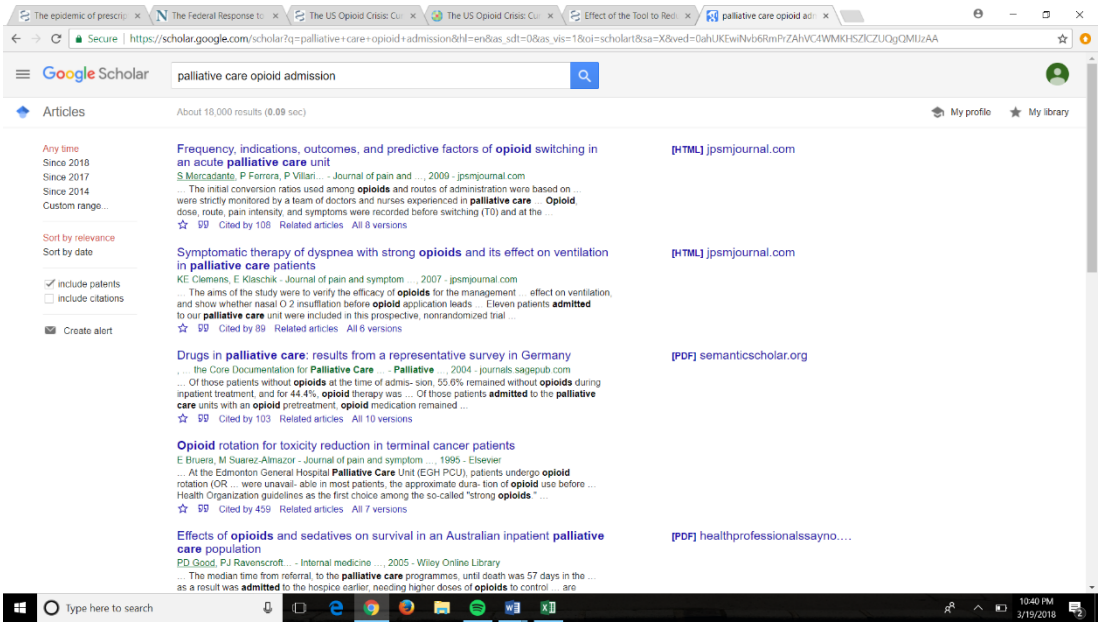
*PubMed Database Screenshot*



# Appendix B

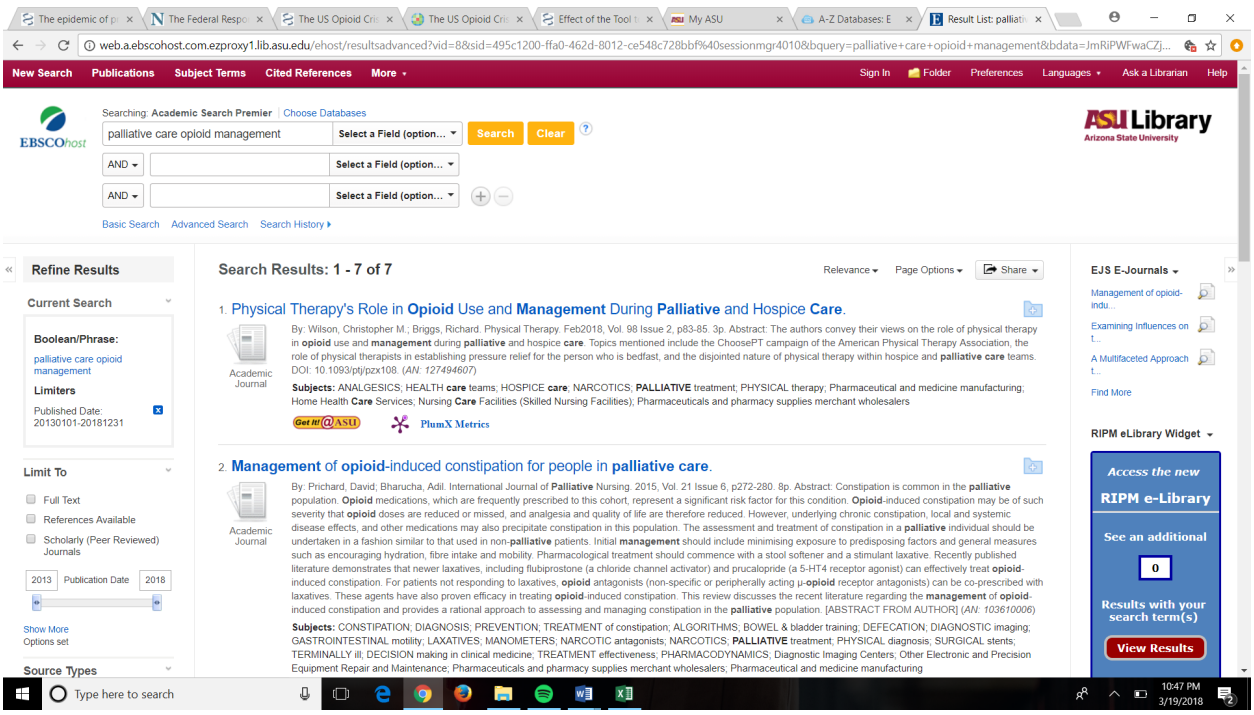
## Table B1

*GoogleScholar Database Screenshot*




## Table B2

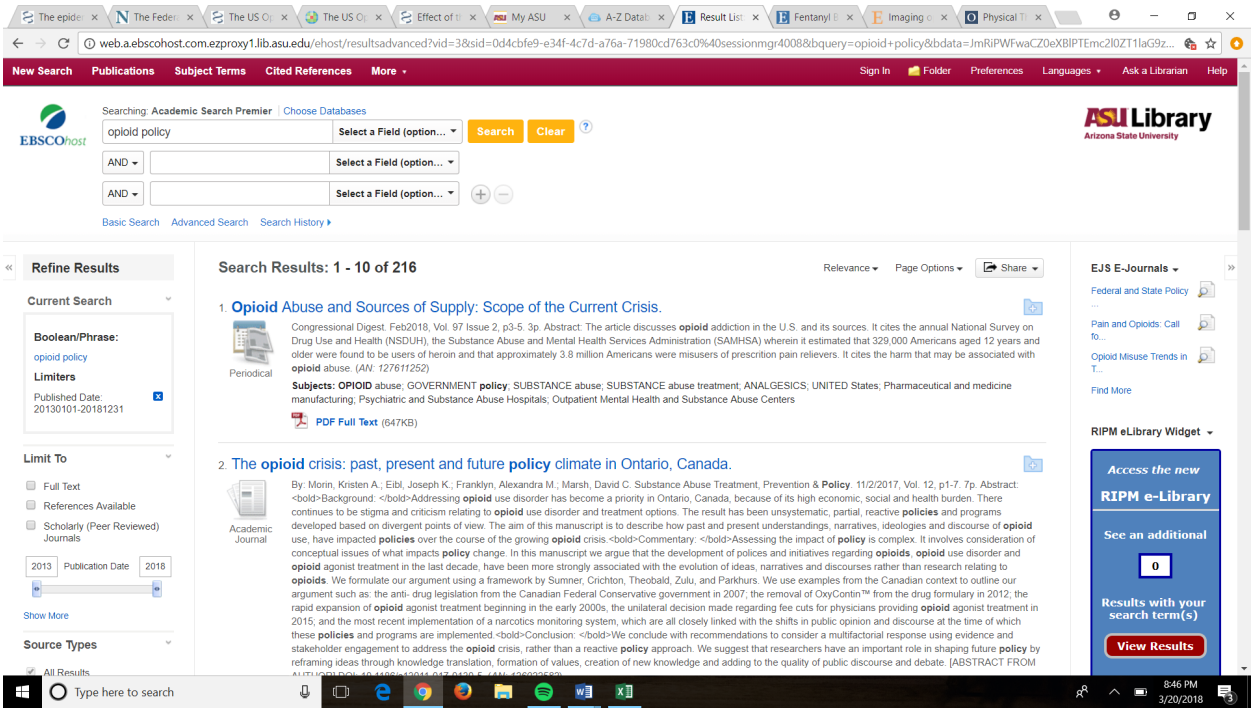
*Academic Search Premier Database Screenshot*



# Appendix C

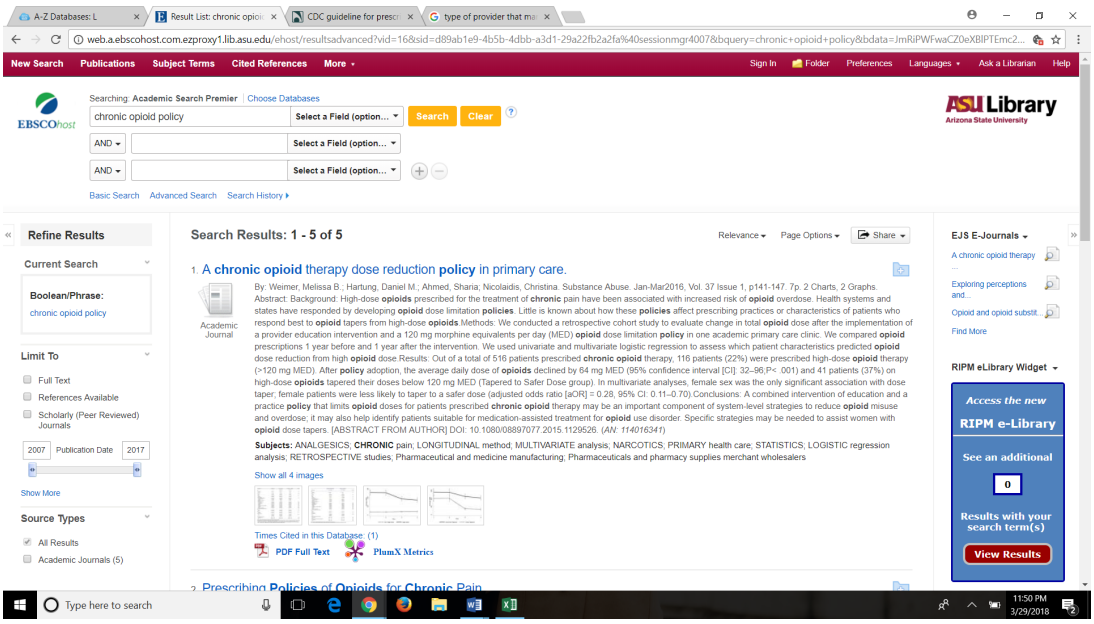
## Table C1

*Academic Search Premier Database Screenshot*




## Table C2

*Academic Search Premier Database Screenshot*



## Appendix D

Table 1
*Evaluation Table: Opioid Management*

| Citation | Theory/ Conceptual Framework | Design/ Method | Sample/ Setting | Major Variables & Definitions | Measurement/ Instrumentation | Data Analysis | Findings/ Results | Level/Quality of Evidence; |
|---|---|---|---|---|---|---|---|---|
| Becker, W., et al. (2017).<br>Country: U.S.<br>Fund: VA's Office of Research and Development, Health Services Research, Substance Use Disorder QUERI<br>Bias: none | Physiologic model | Cohort study<br>**CG**= none<br>**Purpose**: To describe the preliminary efficacy of the ORC | **n**= 87<br>**CG**= none<br>mean age- 56.2<br>Pt. type- 84% pts hx of substance abuse/dependence, 70% pts current misuse of rx o, 22% new substance use disorder dx<br>Setting-ORC | **IV**- involvement in ORC<br>**DV**- mean change in MEDD, patient satisfaction, number of pt.s engaged ORC treatment | Medical record referral from PCP; motivational interviewing | Not identitified- compare pre and post MEDD | Pt.s pre-ORC admit mean of 202.8mg MEDD, post ORC 169.4mg MEDD, pt. satisfaction 3.8/5, | **LOE: IV**<br>**Limitations**: Not shown in statistically significant, no CG |
| Citation | Theory/ | Design/ | Sample/ Setting | Major | Measurement/ | Data | Findings/ | Level/Qualit |

**Key**: ↓- decrease; ↑- increase; **ABC-**addiction behavior checklist; **AUC-** area under curve; **BPI-** brief pain inventory; **CG-** control group; **DV**-dependent variable; **DX**-diagnosis; **ED-** erectile dysfunction; **HADS-** hospital anxiety and depression scale; **HX-**history; **IV**- independent variable; **LOE**- level of evidence; **MAT-** medication-assisted treatment; **MEDD-** morphine equivalent daily dose; **MI**- myocardial infarction; **N**-number of studies; **n**- number of participants; **O-**opioid; **OBGYN-** Obstetrician/Gynecologist; **OCC-**Opioid Compliance Checklist; **OD-** overdose; **OME-** oral morphine equivalent; **ORC**-opioid reassessment clinic; **OUD-** Opioid Use Disorder; **PACIC-** patient assessment of care for chronic conditions; **PCP-** primary care provider; **PDI-** pain disability index; **PO-** by mouth; **PT**-patient; **R**- reliability; **RX-**prescription; **SOAPP-R-** screener and opioid assessment for pain patients revised; **TDD**- total daily dose; **TRIM-** Tool to Reduce Inappropriate Medications;

| | Conceptual Framework | Method | | Variables & Definitions | Instrumentation | Analysis (stats used) | Results | y of Evidence; |
|---|---|---|---|---|---|---|---|---|
| Carrieri, et al. (2014)<br>Country: France<br>Fund: French National Agency for Research on Aids and Viral Hepatitis and French Ministry of Health<br>Bias: None | Physiologic model | Randomized Control trial<br>**Purpose**: compare effectiveness of methadone tx between primary care and specialized care | **N**= 221<br>Primary care, specialized care<br>**Attrition**: 17% | **IV-** supervised methadone treatment for 2 weeks<br>**DV-** abstinence scoring, pt. outcomes, provider outcomes | Self-reported abstinence from street opioids, pt. retention, satisfaction | Intention to treat | Abstinent: 55% primary care, 33% specialized care, ↑ pt. satisfaction in primary care, pt. involvement lower in specialized care, | **LOE: II**<br>Better outcomes with o management in primary care |
| Citation | Conceptual Framework | Design/ Method/ Sampling (Grounded Theory, phenomenology, Narrative …) | Sample/Setting (describe) | Major Variables Studied and Their Definitions | Measurement/ Instrumentation (focus group, 1:1, researcher(s) | Data Analysis | Findings/ Themes | Quality of Evidence |
| Chou, R., et al. (2014).<br>Country: U.S.<br>Fund: Agency for Healthcare Research and Quality<br>Bias: none | Qualitative Document analysis | Descriptive exploratory; grounded theory<br>**Purpose**: review | **N**=39 studies<br>Articles are about long-term o therapy for chronic pain<br>Exclusion: | Risks of O vs placebo in pt.s with chronic pain | Systematic review via questionnaire | Long term o use ↑ risk of abuse/dependen | Buccal fentanyl or intranasal fentanyl more effective | **LOE: II**<br>No difference in dose escalation vs. |

**Key**: ↓- decrease; ↑- increase; **ABC-**addiction behavior checklist; **AUC-** area under curve; **BPI-** brief pain inventory; **CG-** control group; **DV**-dependent variable; **DX**-diagnosis; **ED-** erectile dysfunction; **HADS-** hospital anxiety and depression scale; **HX-**history; **IV**- independent variable; **LOE**- level of evidence; **MAT-** medication-assisted treatment; **MEDD-** morphine equivalent daily dose; **MI**- myocardial infarction; **N**-number of studies; **n**- number of participants; **O-**opioid; **OBGYN-** Obstetrician/Gynecologist; **OCC-**Opioid Compliance Checklist; **OD-** overdose; **OME-** oral morphine equivalent; **ORC**-opioid reassessment clinic; **OUD-** Opioid Use Disorder; **PACIC-** patient assessment of care for chronic conditions; **PCP-** primary care provider; **PDI-** pain disability index; **PO-** by mouth; **PT**-patient; **R**- reliability; **RX-**prescription; **SOAPP-R-** screener and opioid assessment for pain patients revised; **TDD**- total daily dose; **TRIM-** Tool to Reduce Inappropriate Medications;

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| | | current evidence on the effectiveness and harms of O therapy for chronic pain (>=1 year) | conference abstracts, non-english language, nonhuman subjects | | | ce, ↑OD, ↑fractures, ↑MI, ↑use of ED medications or testosterone replacement, | than oral O in acute pain, no difference in methods for o discontinuation, OCC inconsistent accuracy, SOAPP 6 sensitivity .73, 8 .at 68 | maintenance of O on pain, function, risk of withdrawal due to o misuse<br>A lot of questions-insufficient/low evidence |
| Citation | Theory/ Conceptual Framework | Design/ Method | Sample/ Setting | Major Variables & Definitions | Measurement/ Instrumentation | Data Analysis | Findings/ Results | Level/Quality of Evidence |
| Fried, T., et al. (2017).<br>Country: U.S.<br>Fund: Donaghue Foundation and Yale University School of Medicine<br>Bias: none | Physiologic | Randomized clinical trial<br>**Purpose**: determine effectiveness of the web tool, TRIM linking to electronic health record | **n**=64<br>**CG=**64<br>veteran, 65 or older prescribed 7 or more medications random receipt of TRIM or usual care | **IV**: Involvement in TRIM<br>**DV**: physician outcomes, patient outcomes | PACIC<br>Changes in medications | Chi-square, Kruskal-Wallis, p<.10 | Statistically significant: ↑ PACIC >10, ↑ 1+ clinician recommendation, ↑pt. active participation, ↑pt. and clinician medication communication, ↑ clinician facilitative | **LOE: II**<br>Statistically significant, 48.4% errors corrected via medication reconciliation |

**Key**: ↓- decrease; ↑- increase; **ABC-**addiction behavior checklist; **AUC-** area under curve; **BPI-** brief pain inventory; **CG-** control group; **DV**-dependent variable; **DX**-diagnosis; **ED-** erectile dysfunction; **HADS-** hospital anxiety and depression scale; **HX-**history; **IV**- independent variable; **LOE**- level of evidence; **MAT-** medication-assisted treatment; **MEDD-** morphine equivalent daily dose; **MI**- myocardial infarction; **N**-number of studies; **n**- number of participants; **O-**opioid; **OBGYN-** Obstetrician/Gynecologist; **OCC-**Opioid Compliance Checklist; **OD-** overdose; **OME-** oral morphine equivalent; **ORC**-opioid reassessment clinic; **OUD-** Opioid Use Disorder; **PACIC-** patient assessment of care for chronic conditions; **PCP-** primary care provider; **PDI-** pain disability index; **PO-** by mouth; **PT**-patient; **R**- reliability; **RX-**prescription; **SOAPP-R-** screener and opioid assessment for pain patients revised; **TDD**- total daily dose; **TRIM-** Tool to Reduce Inappropriate Medications;

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| | | | | | | | communication, | |
| Citation | Theory/ Conceptual Framework | Design/ Method | Sample/ Setting | Major Variables & Definitions | Measurement/ Instrumentation | Data Analysis | Findings/ Results | Level/Quality of Evidence |
| Hoffman, L., et al. (2017).<br>Country: U.S.<br>Fund: National Institute on Drug Abuse and National Institute on Alcohol Abuse and Alcoholism<br>Bias: none | physiologic | **Design:** Cross-sectional **Purpose:** changes in O misuse among pt.'s with new legislative response | **n**= 396 two Florida based in pt. cohorts | **IV**- legislative response **DV**- pre and post policy opioid use; any O, Rx O, illicit O; PO and Intravenous | Self- report questionnaire **R-** not tested | t-tests chi square analyses Fisher's exact stats | post policy use:<br>any O: ↑24.21%<br>Rx O: ↑20.96%<br>Illicit O: ↑5.85%<br>PO: ↓37.6%<br>Intravenous: ↑34.43% | **LOE: IV** No **CG** Increase in overall o use after policy limit; namely intravenous |
| Citation | Theory/ Conceptual Framework | Design/ Method | Sample/ Setting | Major Variables & Definitions | Measurement/ Instrumentation | Data Analysis | Findings/ Results | Level/Quality of Evidence |
| Jamison, R., et al. (2016).<br>Country: U.S.<br>Fund: Mallinckrodt and Pfizer<br>Bias: none | physiologic | Metanalysis **Purpose**: Assess the efficacy of the OCC for managing chronic | **n**= 177 **CG**: (original study **n**=157) **female**: 106 **male**: 71 patients prescribed O in primary care | **IV**- questionnaires **DV**- pt.'s self-reported answers | OCC, BPI, PDI (R .91), HADS (.83), SOAPP-R (sensitivity .86), ABC, urine toxicology, | Multivariate logistic regression models | "Run out of your pain medication early"- AUC .606 Missed any scheduled medical appointmen | **LOE: III** Questions 5 &6 best identifying o misuse at baseline **Pt.s in PCP had lower drug |

**Key**: ↓- decrease; ↑- increase; **ABC-**addiction behavior checklist; **AUC-** area under curve; **BPI-** brief pain inventory; **CG-** control group; **DV**-dependent variable; **DX**-diagnosis; **ED-** erectile dysfunction; **HADS-** hospital anxiety and depression scale; **HX-**history; **IV**- independent variable; **LOE**- level of evidence; **MAT-** medication-assisted treatment; **MEDD-** morphine equivalent daily dose; **MI**- myocardial infarction; **N**-number of studies; **n**- number of participants; **O-**opioid; **OBGYN-** Obstetrician/Gynecologist; **OCC-**Opioid Compliance Checklist; **OD-** overdose; **OME-** oral morphine equivalent; **ORC**-opioid reassessment clinic; **OUD-** Opioid Use Disorder; **PACIC-** patient assessment of care for chronic conditions; **PCP-** primary care provider; **PDI-** pain disability index; **PO-** by mouth; **PT**-patient; **R**- reliability; **RX-**prescription; **SOAPP-R-** screener and opioid assessment for pain patients revised; **TDD**- total daily dose; **TRIM-** Tool to Reduce Inappropriate Medications;

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| | | pain patients using O compared to an original study | | | | | ts"- AUC.607 | misuse, OCC 3x, then Questions 1,5,6 |
| Citation | Theory/ Conceptual Framework | Design/ Method | Sample/ Setting | Major Variables & Definitions | Measurement/ Instrumentation | Data Analysis | Findings/ Results | Level/Quality of Evidence |
| Lagisetty, P., et al. (2017).<br>Country: U.S.<br>Fund: None identified<br>Bias: none | physiologic | Systematic review<br>**Purpose**: analyze current primary care OUD MAT program interventions and processes that lead to improved pt. outcomes | **N**= 35<br>10 randomized control trials, 25 quasi-experimental interventions in primary care in 8 countries | **IV**- interventions; organization, process, environment, person, technology<br>**DV**- % of studies with common themes | Evaluation tables | Not identified, common themes | ↑pt. retention, consistent need for physician education, | **LOE: II**<br>A lot of themes running throughout, overall best results with multidisciplinary care |
| Citation | Theory/ Conceptual Framework | Design/ Method | Sample/ Setting | Major Variables & Definitions | Measurement/ Instrumentation | Data Analysis | Findings/ Results | Level/Quality of Evidence |

**Key**: ↓- decrease; ↑- increase; **ABC-**addiction behavior checklist; **AUC-** area under curve; **BPI-** brief pain inventory; **CG-** control group; **DV**-dependent variable; **DX**-diagnosis; **ED-** erectile dysfunction; **HADS-** hospital anxiety and depression scale; **HX-**history; **IV**- independent variable; **LOE**- level of evidence; **MAT-** medication-assisted treatment; **MEDD-** morphine equivalent daily dose; **MI**- myocardial infarction; **N**-number of studies; **n**- number of participants; **O-**opioid; **OBGYN-** Obstetrician/Gynecologist; **OCC-**Opioid Compliance Checklist; **OD-** overdose; **OME-** oral morphine equivalent; **ORC**-opioid reassessment clinic; **OUD-** Opioid Use Disorder; **PACIC-** patient assessment of care for chronic conditions; **PCP-** primary care provider; **PDI-** pain disability index; **PO-** by mouth; **PT**-patient; **R**- reliability; **RX-**prescription; **SOAPP-R-** screener and opioid assessment for pain patients revised; **TDD**- total daily dose; **TRIM-** Tool to Reduce Inappropriate Medications;

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| Madsen, A., et al. (2018).<br>Country: U.S.<br>Fund: Maternal and Child Health Bureau, Health resources and services administration, Department of Health and Human Services<br>Bias: none | physiol ogic | Cross sectional survey, mixed methods<br>**Purpose**: to discover OBGYN's knowledge and practice for rx O | **n**= 300<br>**CG=** n/a<br>179 responded OBGYN fellows pat of the Collaborative Ambulatory Research Network | **IV**- questionnaire- 1. Screening for dependence 2. Rx the smallest amount required 3. Tailoring Rx 4. Counseling on proper disposal<br>**DV**- providers responses | Survey; tested on group of volunteer physicians- no adjustments made | Pearson *X*2, Fisher exact test, t-test | Provider responses: 74% rx for smallest # of pills p=.004, 56% aware of proper disposal, 19% know misuse source from friend or family | **LOE: IV**<br>But measurement of prescriber knowledge ….<br>Not statistically significant, but important; 22% O dependence screening, 62% tailor O Rx, 17% counsel on proper disposal |
| Citation | Theory/ Conceptual Framework | Design/ Method | Sample/ Setting | Major Variables & Definitions | Measurement/ Instrumentation | Data Analysis | Findings/ Results | Level/Quality of Evidence |
| Page, J., et al. (2018).<br>Country: U.S.<br>Fund: Moda Health<br>Bias: Authors were employed by Moda Health | physiol ogic | Cohort Study<br>**Purpose**: evaluate effect of voluntary O tapering program on MEDD | **n**=113<br>**CG**= none<br>**attrition**: 7% due to no provider response inclusion: providers with >90 days of pharmacy claims | **IV**- enrollment in O tapering program<br>**DV**- MEDD | Pharmacy records; ICD-10-CM codes | Doesn't specify; compare MEDD before and after program over 3 | Change in MEDD by pt.: 0%, ↓3.6%, ↓4.5%, ↓42.9%, ↓45.5%, ↓46.1% No program | **LOE: IV**<br>**Restrictions**: 6 in program, study measured MEDD for all 113 participants |

**Key**: ↓- decrease; ↑- increase; **ABC-**addiction behavior checklist; **AUC-** area under curve; **BPI-** brief pain inventory; **CG-** control group; **DV**-dependent variable; **DX**-diagnosis; **ED-** erectile dysfunction; **HADS-** hospital anxiety and depression scale; **HX-**history; **IV**- independent variable; **LOE**- level of evidence; **MAT-** medication-assisted treatment; **MEDD-** morphine equivalent daily dose; **MI**- myocardial infarction; **N**-number of studies; **n**- number of participants; **O-**opioid; **OBGYN-** Obstetrician/Gynecologist; **OCC-**Opioid Compliance Checklist; **OD-** overdose; **OME-** oral morphine equivalent; **ORC**-opioid reassessment clinic; **OUD-** Opioid Use Disorder; **PACIC-** patient assessment of care for chronic conditions; **PCP-** primary care provider; **PDI-** pain disability index; **PO-** by mouth; **PT**-patient; **R**- reliability; **RX-**prescription; **SOAPP-R-** screener and opioid assessment for pain patients revised; **TDD**- total daily dose; **TRIM-** Tool to Reduce Inappropriate Medications;

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| | | | with MEDD >0 | | | months | change in MEDD: ↓ in 10.3%, 0% in 20.6%, ↑ in 67.3% | |
| Citation | Theory/ Conceptual Framework | Design/ Method | Sample/ Setting | Major Variables & Definitions | Measurement/ Instrumentation | Data Analysis | Findings/ Results | Level/Quality of Evidence |
| Riggs, C., et al. (2017).<br>Country: U.S.<br>Fund: Department of Pharmacy at Kaiser Permanente Colorado<br>Bias: authors employed by Kaiser Permanente Colorado | physiologic | Cross-sectional<br>**Purpose**: compare average total daily dose of O purchased by Kaiser Permanente Colorado Medicaid pt.s before and after Medicaid short-acting O quantity limit | **n**= 2, 449 pts<br>**CG**= none<br>**Age-** 45.2<br><br>Kaiser Permanente Colorado Medicaid pt.s<br>Inclusion: pt. to purchase at least 1 short-acting O using Medicaid at KP pharmacy | **IV**- Medicaid O quantity limit<br>**DV**- # of O purchased before and after quantity limit | Electronic medical and pharmacy records to assess medication use | Wilcoxon's two sample test and signed-rank test, chi square tests, McNemar's test | Postperiod<br>**TDD**<br>**OME:** ↓ 10mg, p <.0001<br>Long-acting o: ↑3.5% P=.060,<br>Any adjuvant nonopioid: ↓10.9%, p= <.001 | **LOE: IV**<br>**No CG**<br>Statistically significant ↓ in nonopioid rx and TDD OME,<br>↑ in long acting opiods, pvalue not significant |

**Key**: ↓- decrease; ↑- increase; **ABC-**addiction behavior checklist; **AUC-** area under curve; **BPI-** brief pain inventory; **CG-** control group; **DV**-dependent variable; **DX**-diagnosis; **ED-** erectile dysfunction; **HADS-** hospital anxiety and depression scale; **HX-**history; **IV**- independent variable; **LOE**- level of evidence; **MAT-** medication-assisted treatment; **MEDD-** morphine equivalent daily dose; **MI**- myocardial infarction; **N**-number of studies; **n**- number of participants; **O-**opioid; **OBGYN-** Obstetrician/Gynecologist; **OCC-**Opioid Compliance Checklist; **OD-** overdose; **OME-** oral morphine equivalent; **ORC**-opioid reassessment clinic; **OUD-** Opioid Use Disorder; **PACIC-** patient assessment of care for chronic conditions; **PCP-** primary care provider; **PDI-** pain disability index; **PO-** by mouth; **PT**-patient; **R**- reliability; **RX-**prescription; **SOAPP-R-** screener and opioid assessment for pain patients revised; **TDD**- total daily dose; **TRIM-** Tool to Reduce Inappropriate Medications;

## Appendix E

### Table E1

*Synthesis Table: Opioid management*

| Studies | | Becker, W., et al. | Carrieri, et al. | Chou, R., et al. | Fried, T., et al. | Hoffman, L., et al. | Jamison, R., et al. | Lagisetty, P, et al. | Madsen, A., et al. | Page, J., et al. | Riggs, C., et al. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Basics** | Year | 2017 | 2014 | 2014 | 2017 | 2017 | 2016 | 2017 | 2018 | 2018 | 2017 |
| | LOE | IV | II | II | II | IV | III | I | IV | IV | IV |
| | Design | CH | RCT | SR | RCT | CS | MA | RCT, QE, OT | CS, MM | CH | CS |
| | | | | | | | | | | | |
| | Mean Age | 56.2 | | | | | | | | | 45.2 |
| | Attrition | | 17% | | | | | | | 7% | |
| | Bias | | | | | | | | | | X |
| | # of participants | 87 | 221 | 39 | 128 | 396 | 177 | 35 | 179 | 113 | 2449 |
| **Interventions** | policy | | | | | X | | | | | X |
| | O taper | | | X | | | | | | X | |
| | OCC | | | X | | | X | | X | | |
| | SOAPP | | | X | | | X | | | | |
| | ORC | X | | | | | | | | | |
| | TRIM | | | | X | | | | | | |
| | MDC | X | X | | X | | X | X | | | |
| | | | | | | | | | | | |
| **Major Findings** | O use | ↓ | ↓ | I | | ↑IV, ↓ PO, ↑overall | | | | ↓ | ↓, ↑long acting opioids |
| | Pr. S | | | | | | | I | | | |
| | Pt. S | ↑, 3.8/5 | ↑ | ↑ | ↑ | | | | | | |

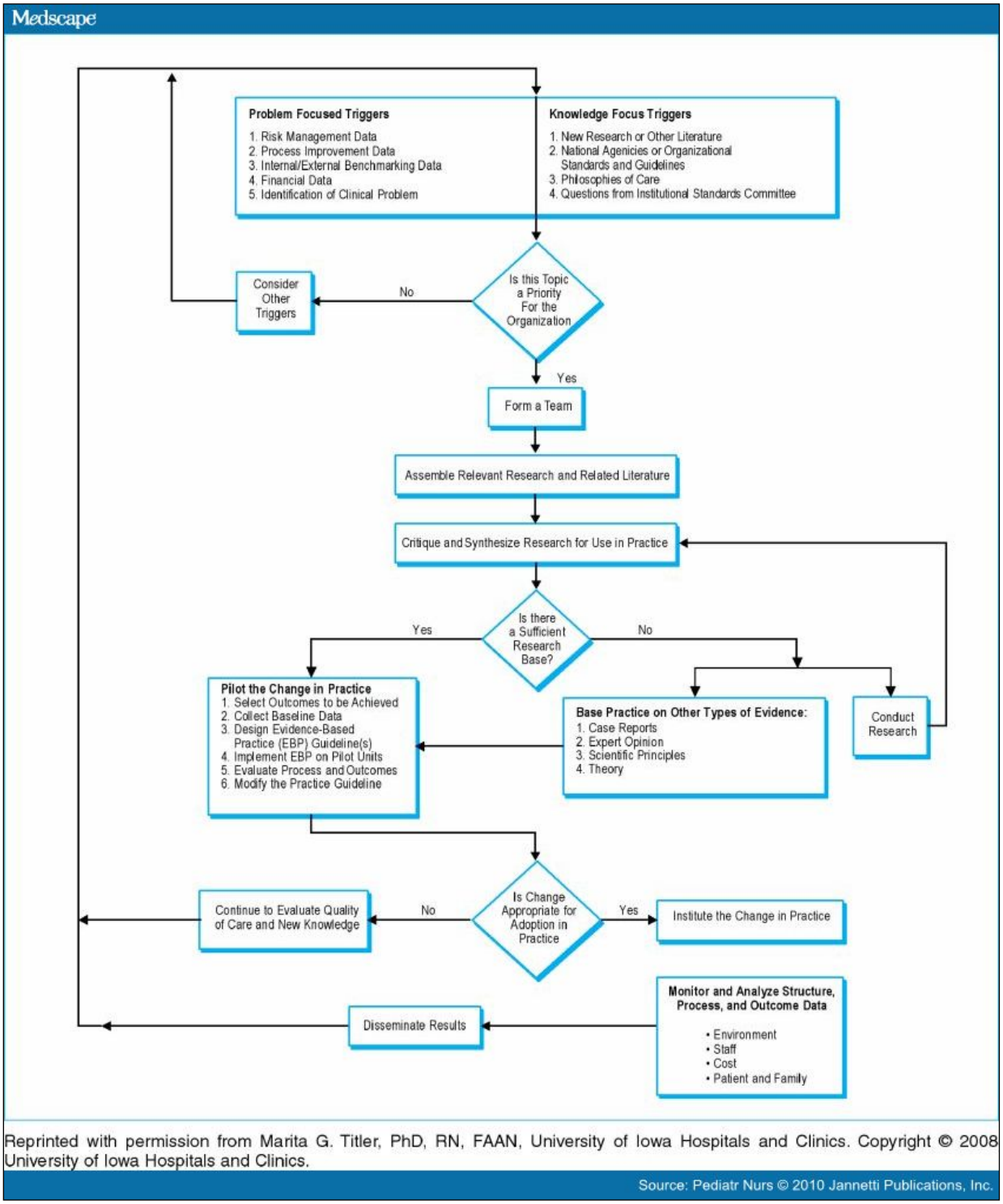
**KEY: ↓ -** Decreased, ↑ - Increased, **CH-** Cohort study, **CS-** cross-sectional study, **I**- insufficient evidence, **LOE**- level of evidence, **MA-** meta-analysis, **MDC**- multidisciplinary care, **MM**- mixed methods study, **O**- opioid, **OCC**- opioid compliance checklist, **OME-** oral morphine equivalent, **ORC**- opioid reassessment clinic, **OT**- observational trials, **Pt**.- Patient, **Pr**- provider, **QE**- quasi experimental**, RCT**- randomized control trial, **S**- satisfaction, **SOAPP**- screener and opioid assessment for patients with pain, **SR**- systematic review, **TDD-** total daily dose, **TRIM-** Tool to Reduce Inappropriate Medications

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | need for provider education | | | | | | | X | X | | |
| | Predictio n of abuse | | | I | | | X | | | | |
| | TDD OME | ↓ | | | | | | | | ↓ | ↓ |
| | Med. Rec. | | | ↑ | X | | | | | | |
| | Pt. followup | | ↑ | | ↑ | | | ↑ | | | |
| | Primary care | | X | | | | X | X | | | |

**KEY: ↓ -** Decreased, ↑ - Increased, **CH-** Cohort study, **CS-** cross-sectional study, **I**- insufficient evidence, **LOE**- level of evidence, **MA-** meta-analysis, **MDC**- multidisciplinary care, **MM**- mixed methods study, **O**- opioid, **OCC**- opioid compliance checklist, **OME-** oral morphine equivalent, **ORC**- opioid reassessment clinic, **OT**- observational trials, **Pt**.- Patient, **Pr**- provider, **QE**- quasi experimental**, RCT**- randomized control trial, **S**- satisfaction, **SOAPP**- screener and opioid assessment for patients with pain, **SR**- systematic review, **TDD-** total daily dose, **TRIM-** Tool to Reduce Inappropriate Medications

## Appendix F

**Iowa model of EBP**

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