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**CHRONIC PAIN AND THE PRESCRIPTION OPIOID OVERDOSE
EPIDEMIC: ADDRESSING PROVIDER ATTITUDES AND
CONERNS**

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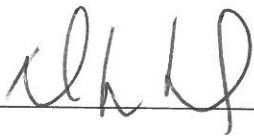
M. Kristen Peek, Ph.D. Chair



Laura Rudkin, Ph.D.



Danny O. Jacobs M.D., M.P.H., F.A.C.S.



Dean, Graduate School

**CHRONIC PAIN AND THE PRESCRIPTION OPIOID OVERDOSE
EPIDEMIC: ADDRESSING PROVIDER ATTITUDES AND
CONCERNS**

by

SEAN MARK PASCHALL, B.S.B.E.

Capstone

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Chronic Pain and The Prescription Opioid Overdose Epidemic: Addressing Provider Attitudes and Concerns

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Sean Mark Paschall, M.P.H.

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Supervisor: M. Kristen Peek

Abstract: Chronic pain affects over 100 million Americans and efforts to improve pain control have led to an epidemic of prescription opioid related overdose deaths. Primary care providers manage the majority of chronic pain patients in the United States but the care provided is highly variable and often a source of frustration for providers and patients. The purpose of this literature review is to examine primary care physicians' attitudes and practice behaviors regarding chronic pain and prescription opioid medications in order to focus educational interventions toward the needs of those distributing opioids and managing the chronic pain of the United States' population. The main limitations of this review are that physician self-report may not represent true practice behaviors and that the majority of studies identified are cross-sectional and therefore cannot causally link provider education to patient and population outcomes. This review demonstrates that primary care physicians feel their formal education and training in pain management was inadequate and they fear that regulatory scrutiny

substantially affects the way they practice medicine. Overall, there are clear needs to: (1) establish straightforward guidelines for pain management to reduce practice variability, (2) implement formal requirements for residency training in primary care regarding pain management and opioid medications, and (3) engage the legal and medical communities to collaborate when implementing policy changes.

Table of Contents

List of Tables.....	viii
List of Abbreviations.....	ix
Chapter 1 Introduction.....	1
Research Question.....	1
Objectives.....	1
Rationale for the review.....	1
Chapter 2 Background.....	2
Chapter 3 Methods.....	6
Database.....	6
Search Strategy.....	6
Inclusion and Exclusion Criteria.....	7
Chapter 4 Results.....	8
Study Selection.....	8
Review Articles.....	9
Educational Intervention Articles.....	9
Practice Aid Articles.....	9
Table 1. Review Articles on Chronic Pain Management Issues in Primary Care.....	10
Table 2. Intervention Articles on Chronic Pain Management Issues in Primary Care.....	11
Table 3. Articles Evaluating Practice Aids for Chronic Pain Management.....	12
Provider Attitudes and Practice Behavior Articles.....	13
Table 4. Articles on Attitudes and Practices of Primary Care Providers on Chronic Pain Management.....	15

Chapter 5 Discussion	20
Policy Change and Fear of Regulatory Scrutiny.....	20
Knowledge Deficits, Best Practices, and Clear Guidelines.....	21
Pain Management Resources: The Need For More Specialists.....	23
Education and Training Improvement.....	23
Bringing the Pieces Together	25
Strengths and Limitations.....	27
Chapter 6 Conclusion	28
References	29
Vita.....	33

List of Tables

Table 1: Review Articles on Chronic Pain Management Issues in Primary Care.....	10
Table 2: Intervention Articles on Chronic Pain Management Issues in Primary Care.....	11
Table 3: Articles Evaluating Practice Aids for Chronic Pain Management.....	12
Table 4: Articles on Attitudes and Practices of Primary Care Providers on Chronic Pain Management.....	15

List of Abbreviations

ACGME	Accreditation Council for Graduate Medical Education
CME	Continuing Medical Education
CNMP	Chronic Non-Malignant Pain
DEA	Drug Enforcement Agency
FDA	Food and Drug Administration
PCP	Primary Care Provider
PMA	Pain Management Agreement

Chapter 1 Introduction

Research Question

What are primary care physicians' attitudes, concerns, and practice behaviors regarding chronic pain management and prescription opiates?

Objectives

The purpose of this report is to examine the available literature on primary care physicians' attitudes and practice behaviors regarding chronic pain and prescription opiates to establish a baseline for primary care education needs in light of the growing opioid overdose epidemic.

Rationale for the review

Overdose death rates have more than tripled from 1991 to 2007 with opioid analgesics as the most common substance now accounting for more deaths than cocaine and heroine combined.¹ The public health sector and government agencies across the country have begun to develop prevention strategies involving policy, education, regulation, and intervention programs to combat the issue. Physician education is a vital piece of this effort, but it is important to understand the current problems primary care providers are facing and their attitudes toward the issue before development of an effective education strategy.

Chapter 2 Background

Pain is the hallmark of human suffering and includes over 1.5 billion people worldwide that endure chronic pain every day in addition to the countless number of people suffering acute pain.² Pain has become so important in the past half century that in 1996 the American Pain Society called pain the “5th vital sign” to raise awareness among providers³:

Vital Signs are taken seriously. If pain were assessed with the same zeal as other vital signs are, it would have a much better chance of being treated properly. We need to train doctors and nurses to treat pain as a vital sign. Quality care means that pain is measured and treated. (James Campbell, Presidential Address, American Pain Society, 1996)

This sentiment was propelled by the Veterans Health Administration which subsequently initiated “Pain as the 5th Vital Sign” campaign in 1999.⁴ As of 2011, over 100 million Americans suffer from chronic pain.⁵ For those utilizing opioid medication to treat their pain 51% felt they had little control of their pain.^{5,6}

Despite the high prevalence of pain in the United States, treatment is highly variable and often frustrating for healthcare providers. Moreover, the death rate relating to prescription pain medication has been rising in recent years.⁷ Educational efforts aimed at providers are a key tool to help curb the rising opioid related overdose deaths as well as more effectively manage the pain of the affected population. Before initiating educational changes, however, we must understand the scope of the problem and what aspects of pain management providers struggle with and perceive to be hindering effective care.

Today pain is a well-recognized problem among the population, and primary care physicians are at the front lines of pain management with 63% of chronic pain

sufferers having visited their family doctor for pain control and only 15% seeing pain management specialists.⁸ Unfortunately, efforts to improve pain control have led to a modern epidemic of prescription drug abuse and opioid overdose deaths in the United States. In the U.S. prescription drugs have become the second-most abused category of drugs following marijuana and, in 2007, 12,000 of the 28,000 deaths from unintentional drug poisoning involved prescription pain relievers.^{7,9} According to the Centers for Disease Prevention and Control for each one of these deaths, 9 individuals are admitted to an inpatient facility for substance abuse, 35 visit the emergency department, 161 report drug abuse or dependence, and 461 will use opioid analgesics nonmedically.¹⁰ Societal costs are also climbing with nonmedical use of prescription painkillers alone estimated to cost health insurers \$72.5 billion annually in 2007.¹

The death rate from opioid analgesics rose across all age groups from 1999 to 2006, and in those ages 45 to 54 there was more than a three fold increase.¹¹ Non-Hispanic Whites, persons with low socioeconomic status, and those in rural areas are the most at risk for opioid overdose along with persons with mental illness who are also more likely to be prescribed opiates.¹⁰ Although men are at a higher risk than women overall, the death rate has increased more rapidly for women than men. In 2010 the death rate reached 9.8 per 100,000 women, a more than 400% increase since 1999 compared to only 265% increase for men.¹² Reports have also shown that women are more likely to be prescribed opiate medications and are also more likely to engage in doctor shopping (seeking out prescriptions from multiple doctors without the other knowing).^{13,14} Overall, the Centers for Disease Prevention and Control report that the populations most at risk for opioid overdose are those on long-term opiate therapy and those who report nonmedical

opiate use, of whom 76% report the medication they obtained was prescribed to someone else.^{9,10,15}

These statistics have placed chronic pain and prescription drug abuse in the limelight in recent years and raised substantial concerns in the public health sector. As a result, efforts to control this epidemic have gained considerable momentum with organizations like the Robert Wood Johnson Foundation and Trust for America's Health, which have outlined steps to abate prescription drug abuse.¹⁶ One of the tenets recognized by most organizations and government agencies is provider education. Although prior efforts like "Pain as the 5th Vital Sign" have led to physicians more routinely measuring pain, these programs have not increased the quality of pain management.¹⁷ Even more problematic is the fact that opioid pain reliever overdose deaths, treatment admissions, and the amount of opioids sold in the U.S. have continued to rise since that time.¹

To address this issue a multifaceted approach involving policy change, public awareness and education, proper surveillance, substance abuse treatment, community involvement, and provider education is necessary. Primary care providers are tied to every one of these approaches and thus their knowledge and ability are crucial to developing a successful initiative. Primary care providers increase public awareness, become operators of proper surveillance, are directly involved in substance abuse treatment, affect and are affected by policy change, and are a strong voice in communities across the nation. Therefore, provider education on pain management, prescription drug abuse, prescription drug monitoring programs, and substance abuse treatment is paramount when moving forward with these efforts.

In order to help focus the educational efforts for primary physicians regarding pain management and opioid use, this paper reviews the available literature on primary care physicians' attitudes and practice behaviors regarding chronic pain and prescription opiates. This review will aid in establishing baseline information for primary care educational needs in light of the growing opioid overdose epidemic.

Chapter 3 Methods

To address this question a systematic review of published literature in the Medline database was conducted on the subject of provider attitudes and practices regarding chronic pain management and opioid use.

Database

Databases searched included Medline (Ovid and Pubmed). Articles will be selected based on the criteria below. Additional articles not identified from these databases will be abstracted from the references of those articles selected base on the same criteria. The last search was conducted in April 2014.

Search Strategy

The following basic search strategy was used:

Attitude of Health Personnel [MeSH]

AND

Primary Health Care [MeSH] OR Physicians, Family [MeSH] OR Family Practice [MeSH] OR General Practice [MeSH] OR Internal Medicine [MeSH]

AND

Narcotics [MeSH] OR Analgesics, Opioid [MeSH] OR Opioid-Related Disorders [MeSH]

AND

Pain [MeSH] OR Chronic Pain [MeSH] OR Pain Management [MeSH]

Inclusion and Exclusion Criteria

Articles were limited to those published in the year 2000 or later because a rise in pain medication overdoses occurring in the early 2000's prompted the start of regulation changes by the Food and Drug Administration (FDA).¹⁸ Articles will not be excluded based on type of study or the specific topic within opioid therapy and pain management. Articles focused on a specific diagnosis of pain (i.e. joint pain), a specific opioid analgesic, or a specific ethical issue were eliminated because this review is focused on the general practice surrounding opioid use for chronic pain and not on the specific nuances of therapy or affiliated issues with a specific diagnosis or ethical dilemma. Articles concentrated on acute pain, cancer pain or terminal patient practices, or pediatric pain were eliminated because treatment standards and complications for these patients differs substantially from therapy for chronic non-cancer pain patients. Articles not in English or studies conducted outside of the United States were excluded because government regulations surrounding opioid medications differ in other countries and could affect physician attitudes and concerns. Once the final selection of articles was made, references from those articles were reviewed for possible inclusion based on the above criteria.

Chapter 4 Results

Study Selection

Forty-nine articles were identified from the search strategy. Six articles were eliminated based on year of publication prior to 2000. Upon review of article titles and abstracts, 22 were eliminated based on the above exclusion criteria. One article focused on acute pain; 1 article was published in German; 4 were related to countries other than the United States; 6 addressed a specific type of pain or a specific diagnosis (i.e. joint pain); 2 focused on specific ethical issues; 3 addressed the use of a specific opioid analgesic; 2 discussed terminal and/or cancer related pain management, and 3 were non pertinent to this review. After reviewing the remaining 21 articles, 12 more were eliminated based upon the above criteria: 1 was published after 2000 but the data collected were from 1993, 3 discussed specific ethical issues; 1 focused on terminal and/or cancer related pain; 2 were related to a country other than the United States; 1 involved a specific drug, and 4 were not pertinent to this review (1 involved discharging opiate abusers from opiate therapy; 1 on the legal issues surrounding physicians being deceived, 1 was a reaction article to another article, and 1 was an evaluation of the user interface for an opioid decision support system).

The references of the remaining 9 articles were reviewed for inclusion in the literature review based upon the above inclusion and exclusion criteria. Nine articles were selected based on title for further review, and all 9 met the criteria to be included in this review. The final analysis included 18 articles.

Review Articles

The articles reviewed were broken down into four categories. The first category was review articles, which included two articles from the search (Table 1). These articles highlight the low level of pain management training in primary care training, fear of regulatory scrutiny associated with prescribing opioids among primary care providers, and perceived low competency in pain management knowledge and skills.^{19,20}

Educational Intervention Articles

The second category included articles which evaluated educational interventions for primary care providers (Table 2). These articles showed an overall positive satisfaction from the subjects regarding the educational interventions and demonstrated improved pain management skills and quality of patient interactions.^{21,22}

Practice Aid Articles

Articles in the third category focused on the evaluation of practice aids for physicians regarding pain management and opioid use (Table 3). The first article in this category focused on pain management agreements and exhibited the usefulness of these contracts with respect to opioid medications and disproved some potential negative affects of the contracts such as increased in patient threats.²³ The second article in Table 3 showed that most Washington physicians felt the Washington State Opioid Dosing Guideline to be helpful but also exhibited a low rate of regular urine drug screens, patient education tools, and tracking physical function in patients.²⁴

Table 1. Review Articles on Chronic Pain Management Issues in Primary Care

Author, Year	Study Type	Results	Limitations
Glajchen, Myra 2000	Review	<ul style="list-style-type: none"> • Low priority given to pain treatment in medical school and residency -88% reported that their medical school education in pain management was inadequate -73% reported that residency training was fair to poor • 76% report low competency in patient assessment as a major barrier to effective pain prescribing • Fear of regulatory scrutiny shown to discourage adequate strength of opioids 	May not represent the full scope of the problem or opinions
Russell, David et al. 2006	Review	<p>Primary Care Barriers to opioid treatment use</p> <ul style="list-style-type: none"> • Fear of inducing addiction • Fear of contributing to a pre-existing substance abuse problem • Regulatory issues • Low self-confidence in pain management <p>Recommendations</p> <ul style="list-style-type: none"> • Education on when to refer to a specialist • Pain contracts • Pain management assessment education/tools • Drug Testing 	May not represent the full scope of the problem or opinions

Table 2. Intervention Articles on Chronic Pain Management Issues in Primary Care

Author, Year	Study Type	Intervention/Subjects/ Sample Size	Results	Limitations
Sullivan, Mark et al. 2005	Randomized Control Trial	Teaching shared decision-making model concerning opioids and chronic pain versus just providing materials Internal Medicine Physicians Intervention: N=22 Control: N=23	<u>Significant improvements post intervention:</u> Physician Satisfaction: p<0.01 Patient relationship quality: p<0.05 Appropriate use of time: p<0.05 Information giving to patients: p<0.05 More likely to use methadone: p<0.05 Set functional goals: p<0.01 82% of physicians reported the training as useful 73% reported feeling more competent Focus group (n=4) listed 3 benefits 1. Less antagonistic patient encounters 2. Increased patient treatment agreement use 3. Focus on function of patient <u>Not significant:</u> Perception of patient cooperation data collection	Self-report bias Small sample
Scott, Emma et al 2009	Intervention Trial	Interactive conferences series, email vignettes, and didactic sessions Internal Medicine Residents Pre-Intervention Survey N=65 Post-Intervention Survey N=63	<ul style="list-style-type: none"> • Self Perception of pain management knowledge increased from 40% to 60%: p=0.02 • Self Perception of training adequacy increased 38.5% to 55.6%: p=0.05 • Opioid Knowledge: no significant improvement except in subset who completed Oncology rotation: p=0.003 • Opioid Conversion improved: p=0.02 • Reluctance to prescribe opioids improved by 20%: p=0.05 • Documentation practices did not improve 	No control group Cannot be generalized to other primary care specialties

Table 3. Articles Evaluating Practice Aids for Chronic Pain Management

Author, Year	Study Type	Practice Aid/Subjects/Sample Size	Results	Limitations
Fagan, Mark et al. 2008	Cross-sectional	Pain Medication Agreements Internal Medicine Residents N=110	<ul style="list-style-type: none"> • 90% found the PMAs useful for managing CNMP -reducing multiple providers of pain medication -reducing early refill requests -reducing telephone calls -making it easier to discuss potential problems with opiate use -Making it easier to identify patients who are abusing medication • 50% reported that 60% to 80% of their patients signed PMAs • Use of PMAs not associated with patient threats, patients leaving, or discharging patients (p=0.40, p=0.26, p=0.47 respectively) 	<p>Cannot be generalized to other primary care specialties</p> <p>Cannot be generalized to attending physicians</p>
Morse, Josiah et al. 2011	Cross-sectional	Washington State Opioid Dosing Guideline Primary Care Providers N=553	<p><u>Practice Demographics:</u> 89% report they treat CNMP 22% reported that >50% of their patients have CNMP 54% have frequent concerns about dependence, addiction, or diversion when using opioids 22% report unsuccessful attempts to get a pain consultation (62% were due to no insurance)</p> <p><u>Best Practice Utilization:</u> 69% regularly use opioid agreements 96% report regularly checking patient history of substance abuse 38% regularly us urine drug screens 38% regularly us patient educational tools 30% regularly track pain 12% regularly track physical function</p> <p><u>Guideline usefulness:</u> 45% of providers had read and applied the Guideline 75% report the 120 mg/day yellow flag as reasonable 39% reported the Guideline as very useful, 52% reported somewhat useful</p>	<p>Non-response Bias</p> <p>Cannot be generalized outside of Washington</p>

Provider Attitudes and Practice Behavior Articles

The fourth category included twelve articles concerning the attitudes and practices of primary care providers on chronic pain management (Table 4). Review of the articles demonstrated that chronic pain represents a large portion of practice for primary care physicians^{25,26} with 52% of chronic pain patients being managed by PCPs²⁷ and 19% of patients in a primary care provider (PCP) practice on opiates.²⁸

Four of the articles indicated that many physicians feel that prescribing opiates on an on-going basis for patients, especially in high doses, will attract regulatory scrutiny^{27,29-31} while one article found that fear of regulatory scrutiny did not affect opiate prescribing habits.²⁶ A minority of physicians indicated utilizing best practice methods such as urine drug screening, documented physical exam, documented plan, and pain medication agreements.^{25,29,32} Concerns about abuse, addiction, and dependence were common with 84.2% fearing abuse³², 51% believing prescribing opioids would lead to addiction³¹, and 40% fearing dependence.²⁸ Four articles found that a large majority of primary care providers find managing chronic non-malignant pain (CNMP) frustrating and time consuming, and few enjoy working with these patients.^{28,30,31,33} Two articles also found that primary care physicians feel they have inadequate access to pain specialists and referral resources.^{33,34}

Finally, five of the articles indicated a lack of physician satisfaction with medical school education or residency training regarding opioids and chronic pain management^{26,29,30,32,35} but two articles found that younger physicians were less likely to feel training was inadequate.^{29,35} More than half report that formal medical training had a positive affect on their attitude toward caring for those with chronic conditions³⁵ and

more medical training correlated with more confidence and more prescribing of long-acting opioids.²⁷ However, there was no correlation between number of continuing medical education (CME) hours in chronic pain and prescribing opioids less often because of regulation.²⁷

Lastly, one article compared PCPs to pain specialists and found that both groups felt that functional status was the best indicator of patient outcomes. In comparison to pain specialists, however, PCP's placed more weight on side effects, lack of change in pain score, deterioration in relationships, and multiple allergies to non-opioids to indicate failure of treatment.³⁶ Pain specialists also put more weight on mood and less healthcare utilization as indicators of a good outcomes, whereas while PCPs focused more on stable dose and quality of life.³⁶

Table 4. Articles on Attitudes and Practices of Primary Care Providers on Chronic Pain Management

Author, Year	Study Type	Subjects/ Sample Size	Results	Limitations
Potter, Michael et al. 2001	Cross-sectional	Primary Care Physicians in the UCSF/Stanford Collaborative N=161	<ul style="list-style-type: none"> • 37% of physicians never willing to prescribe schedule II opioid for an ongoing basis • Concern about physical dependence was the best predictor of willingness (less concern=more willing) • 15% of physicians “enjoy working with patients who have CNMP” • Substantial variability in willingness to prescribe opioids with regard to clinical scenario • 45% physicians felt they had inadequate consultation and referral resources 	<p>Non-response bias (70% response rate)</p> <p>Self-report bias</p> <p>Not generalizable outside California</p>
Green, Carmen et al. 2001	Cross-sectional	Michigan Physicians N=368	<ul style="list-style-type: none"> • 30% reported no pain management education in medical school, residency, or via CME • 10% received pain management education during medical school • Younger physicians were more likely than older physicians to have received education P<0.001 • 30% used opioid contracts • Most physicians believe prescribing strong opioids would attract medical review 	<p>Non-response bias (26% response rate)</p> <p>Self report bias</p> <p>Not generalizable outside Michigan</p>
Clark, J. et al. 2002	Retrospective chart review	Attending physicians at a Veterans Affairs hospital N=300	<ul style="list-style-type: none"> • 97% of patients in this study were male • 48% of patients had CNMP (44% were axial skeletal pain, 33% large joint) • 75% on pharmacological therapy (44% on opioids) • 85% of opioids were short-acting “as needed” at an average of 33mg/day • 41% had a documented physical exam of the pain complaint • 39% had a documented treatment plan or follow-up plan 	<p>Not generalizable outside a Veterans Affairs Hospital setting</p>

Table 4. Articles on Attitudes and Practices of Primary Care Providers on Chronic Pain Management (cont.)

Author, Year	Study Type	Subjects/ Sample Size	Results	Limitations
Darer, Jonathan et al. 2004	Cross-sectional	U.S. Physicians N=1236	<ul style="list-style-type: none"> • 63% said they had not received adequate training in chronic pain management • 61% said they had not received adequate training in interdisciplinary teamwork with non physician providers • Physicians graduating in the last ten years were less likely to report inadequate training in chronic diseases • 51% reported that medical training had a positive effect on their attitude toward caring for those with chronic conditions 	<p>Self-report bias</p> <p>Study included but was not focused on chronic pain management</p>
Ponte, Charles et al. 2004	Cross-sectional	West Virginia Family Practice Physicians N=185	<ul style="list-style-type: none"> • 80% were anxious about prescribing high-dose opioids for chronic nonmalignant pain • 85% reported frustration with chronic nonmalignant pain patients and felt it was time consuming • 67.6% indicated that scrutiny by regulatory agencies affected their prescription of opioids • 60% felt their formal medical training did not prepare them to effectively manage pain • Significant difference in correct response rate regarding knowledge of fentanyl patch and age $p=0.035$ (Physicians aged 50-54 more incorrect responses) 	<p>Self report bias</p> <p>Non-response bias (response rate 34.5%)</p> <p>Not generalizable outside West Virginia</p>
Upshur, Carole et al. 2006	Cross-sectional	Primary Care Providers in Massachusetts N=111	<ul style="list-style-type: none"> • 37.5% of adult patients seen in the clinics had a current chronic pain complaint • Providers rated patient self-management, patient psychological factors, and patient compliance as preventing optimal pain treatment the most over provider expertise • 81.5% of attending physicians felt their medical school education about chronic pain was insufficient and 54.7% felt their residency training was insufficient. • Did not identify law enforcement scrutiny as an important issue preventing opioid prescribing 	<p>Self report bias</p> <p>Non-response bias (response rate 62.3%)</p> <p>Not generalizable outside Massachusetts</p>

Table 4. Articles on Attitudes and Practices of Primary Care Providers on Chronic Pain Management (cont.)

Author, Year	Study Type	Subjects/ Sample Size	Results	Limitations
Nishimori, Mina et al. 2006	Cross-Sectional	Primary Care and Pain Specialists in Massachusetts N=147 (PCPs=82) (Pain specialists=65)	<ul style="list-style-type: none"> • Strong belief in long-term opioid therapy correlated with having more patients on long-term opioid therapy • More PCPs felt inability to return to work indicated treatment failure than pain specialists (93% to 79%, p=0.01) • More PCPs felt deterioration in relationships indicated treatment failure than pain specialists (91% to 77%, p<0.01) • More PCPs felt no improvement in pain control indicated treatment failure than pain specialists (89% to 75%, p=0.03) • More PCPs felt multiple stated allergies or side effects to non-opioid analgesics indicated treatment failure than pain specialists (67% to 36%, p<0.001) • Both PCPs and Pain specialists felt that changes in function was the best indicator of outcome • Pain specialist placed less weight on side effects and pain control than PCPs • Pain specialist considered improved mood and less healthcare utilization as indicators of good outcome. PCPs focused on stable dose and quality of life. 	<p>Small sample size</p> <p>Self-report bias</p> <p>Not generalizable outside Massachusetts</p>
Bhamb, Bhushan et al. 2006	Cross-sectional	Wisconsin family medicine or internal medicine physicians N=248	<ul style="list-style-type: none"> • 44% of PCP's denied having ever attended a lecture in medical school or residency about narcotics for chronic nonmalignant pain • The most common reported narcotics utilized were codeine, hydrocodone, oxycodone, morphine CR and oxycodone ER • Most common reported pain diagnosis was osteoarthritis, chronic low back pain, migraine headaches, degenerative joint disease, and fibromyalgia • 93% of PCP's report they do not do urine toxicology screening before starting narcotics on new patients for chronic pain • 84.2% report they are concerned about patients abusing their prescriptions 74.9% are concerned about addiction • PCP's were less comfortable prescribing narcotics for low back pain than for terminal cancer • Physicians who had a system in place to track patients on narcotics were 2.45 times more likely to utilize urine toxicology screening (p=0.015) 	<p>Self report bias</p> <p>Not generalizable outside Wisconsin</p>

Table 4. Articles on Attitudes and Practices of Primary Care Providers on Chronic Pain Management (cont.)

Author, Year	Study Type	Subjects/ Sample Size	Results	Limitations
Nwokeji, Esmond et al. 2007	Cross-sectional	Texas Family Physicians from the Texas Academy of Family Physicians N=267	<ul style="list-style-type: none"> • 80% believed long-acting opioids would be effective in controlling pain • 80% believed long-acting opioids would improve quality of life • 78% believed they were likely to encounter regulatory scrutiny from prescribing long-acting opioids • 51% believed prescribing long-acting opioids would lead to patient addiction • 65% believed prescribing long-acting opioids would be time consuming 	<p>Self report bias</p> <p>Non-response bias (response rate 10%)</p> <p>Bias to technologically inclined (emailed based survey)</p> <p>Not Generalizable outside Texas</p>
Dobscha, Steven et al. 2008	Cross-Sectional	Veterans Affairs primary care clinicians N=45	<ul style="list-style-type: none"> • The mean percent of PCP's patients on opioids was 19% • 71% report feeling confident in their ability to treat chronic pain • 77% agreed that skilled pain management is a high priority • 73% report patients with chronic pain are a major source of frustration • 40% report their management of chronic pain is influenced by fear of contributing to physical dependence • 20% report patients they treat with opioids become addicted more than half the time • The average PCP felt neutral about ability to provide optimal treatment for pain. • Job satisfaction was negatively correlated with fear of contributing to dependence and percent of their patients that are chronic pain patients 	<p>Self-report bias</p> <p>Small sample size</p> <p>Not generalizable outside the VA setting</p>

Table 4. Articles on Attitudes and Practices of Primary Care Providers on Chronic Pain Management (cont.)

Author, Year	Study Type	Subjects/ Sample Size	Results	Limitations
Remster, Erin et al. 2008	Cross-sectional	Clinicians at a chronic pain continuing medical education conference N=22	<ul style="list-style-type: none"> • 68% of responders were primary care providers • 68% of responders reported writing prescriptions for opioids several times each week • Perceived barriers to effective pain management: <ol style="list-style-type: none"> 1. Inadequate access to pain specialists 2. Physician reluctance to prescribe opioids 3. Inadequate access to health care due to financial burden 4. Lack of objective measurement of pain 	<p>Self report bias</p> <p>Small sample size</p> <p>Not generalizable to non-rural setting</p> <p>Selection bias</p>
Breuer, Brenda et al. 2010	Cross-sectional	National Survey of attending practitioners N=817	<ul style="list-style-type: none"> • 52% of pain patients are treated by PCPs. 2% by pain physicians • PCPs refer 26% of their chronic pain patients to pain physicians and 29% to physical therapist • PCP's use NSAIDS or tramadol for chronic pain 72% of the time compared to 55% for pain physicians • Pain physicians use long acting opioid twice as much as PCP's for pain (13.5% to 6.5%) • PCPs least likely to favor mandatory pain education for all PCPs: $p < 0.01$ • Pain physicians use non-traditional analgesics 140% more than PCPs • 29% PCPs prescribe opioids less often than appropriate because of regulatory concerns compared to 16% for pain physicians: $p < 0.0001$ • For PCPs, correlation between number of chronic pain CME hours and: <ul style="list-style-type: none"> - confidence in managing musculoskeletal and neuropathic pain: $\rho = 0.4$, $p < 0.0001$ -The percentage of chronic pain patients being treated with long-acting opioids and methadone $\rho = 0.3$, $P < 0.0001$ • Number of chronic pain patients referred to pain specialists by PCPs correlated with: <ul style="list-style-type: none"> -The percentage of patients they treat with NSAIDS and tramadol -Negatively correlated to the percentage they treat on an on going basis -Negatively with their confidence to treat neuropathic pain • No correlation between number of chronic pain CME hours and prescribing opioids less often because of regulatory concerns • PCPs age correlated with agreeing that they “prescribe opioids less often because of concerns about regulatory oversight” 	<p>Self report bias</p> <p>Non-response bias (response rate 29%)</p> <p>Some patients being treated by more than one type of provider</p>

Chapter 5 Discussion

The under treatment of pain and the rising rate of prescription pain killer overdose deaths are placing opposing pressures on providers trying to find an optimal balance in helping patients manage pain. Meanwhile millions of patients are either left with poor pain control or put at an unnecessary risk of prescription drug overdose, dependence, and addiction. The results of this review indicated that there is clearly a need to improve the abilities and confidence of the primary care provider work force in the U.S. The review also suggests that educational interventions improve provider competency in pain management and opioid use and that practice aids appear to be beneficial in assisting providers and keeping patients safe. The review articles examined also support these conclusions and convey a strong need for a major change in chronic pain and opioid education and training.

Policy Change and Fear of Regulatory Scrutiny

In light of the dramatic rise in prescription opioid related overdose deaths, several efforts have been made by state and federal agencies to combat the issue. These efforts include the FDA's recommendation to reschedule hydrocodone containing drugs from schedule III to schedule II, strengthening surveillance through prescription drug monitoring programs, and revising the labeling of prescription opioids to improve patient use and safety.³⁷ Although policy changes and increased surveillance are crucial to affect the health of the population, regulatory scrutiny is a large concern from primary care providers.^{27,29-31,36} Some health care professionals and policymakers, however, argue that this fear is unwarranted and point out that few physicians have actually been investigated by the Drug Enforcement Agency (DEA) and state board

agencies.³¹ In contrast, the Association of American Physicians and Surgeons has characterized the regulatory environment as a witch-hunt and some general practitioners have recommended against prescribing opioids for chronic pain based on their own legal encounters.³⁸ The medical and legal communities need to come together to address these issues in order to move toward safer practices and well-controlled pain for the U.S. population. Specifically, while policy reform should focus on overdose prevention and address prescription misuse, the qualifications for prescription misuse that would result in legal action should be clearly stated such that providers can be certain of what is and is not acceptable prescribing habits. This will decrease fear of regulatory scrutiny and not deter physicians from treating their patient's pain.

Knowledge Deficits, Best Practices, and Clear Guidelines

This review also revealed a substantial fear of inducing addiction or dependence in patients and a fear of abuse if opioids are used to treat chronic non-malignant pain.^{28,31,32} One key factor contributing to this fear is simply a knowledge deficit with physicians overestimating the prevalence of addiction and tolerance.^{31,39} Refining the knowledge of primary care providers through formal training and education should diminish these unfounded fears and improve the quality of pain management, but it will only improve the safety of such care if it includes training to utilize best practices.

As few as 7% of primary care physicians reported using urine toxicology screening before initiating opioid therapy on a new patient³² and only 30% used pain medication agreements with their patients.²⁹ Along with documenting a physical exam and a clear plan, these are basic steps that ensure that the provider and patient are in agreement with the treatment plan, safety, and expectations of both the provider and patient. Pain management agreements (PMA)

dissolve the stigma and anxiety associated with administering regular urine toxicology testing and empower providers to address unsafe behavior without confrontation. For example Fagan and colleagues found that 90% of internal medicine residents found PMAs to be useful overall, making it easier to identify patients who are abusing medication and easier to discuss potential problems with the patient.²³ In addition, PMAs also reduced patient use of multiple providers, refill requests, and telephone calls to the clinic.²³ Utilizing pain management agreements improves pain management in three key ways: (1) PMAs facilitate patient encounters while decreasing the work load of the clinic (2) they improve safe practices both by the patient and provider and (3) they yield improved documentation and appropriate use of opioid medications which should aid in reducing fear of regulatory scrutiny.

Implementing these practices will go a long ways to improve the health and safety of those across the U.S., but they need to be paired with simple, straightforward guidelines regarding long term opioid medication therapy. Institutional and practice guidelines for pain management are scarce and although a number of initiatives have been undertaken to produce guidelines, no set of guidelines has become common practice.^{22,40} Lack of clear guidelines is partly responsible for the notable variability in provider practices surrounding chronic pain management and opioid use. This uncertainty paired with the recent rise in opioid related overdose deaths and law enforcement cases being misconstrued by the media has led to considerable anxiety among providers.³⁰ Morse and colleagues found that 91% of providers in Washington State found their guideline to be either somewhat useful or very useful but only 45% reported they had read and applied it.²⁴ Establishing clear and concise practice guidelines for chronic pain management that can be learned during physician training and integrated into the

practices across the country will be a key step to clearing the confusion, anxiety, and unsafe practices in opioid therapy.

Pain Management Resources: The Need For More Specialists

Beyond improving best practices and establishing clear guidelines among primary care providers, an effort must be made to fill the need of pain specialists and care in the U.S. This point was highlighted by Potter and colleagues who found that 45% of primary care physicians felt they had inadequate access to consultation and referral resources among physicians in the Stanford/UCSF collaborative and by Remster who demonstrated a clear perception of need in rural Appalachia.^{33,34} The need for more resources in specialized care for pain management can be met by increasing the number of fellowship positions offered for specialization in pain medicine, but also by efforts to optimize referral patterns to these consulting physicians. Improving best practices and establishing clear guidelines will equip primary care providers with the ability to handle more complex chronic pain patients and decrease the need for, and improve the quality of referrals to pain specialists.

Education and Training Improvement

The overarching theme of these discussions is a clear need for improvement in the education and training of primary care physicians. The Accreditation Council for Graduate Medical Education (ACGME) has recently undergone a shift that requires documentation of resident's milestones in their professional development as physicians, but there is no specific requirement regarding pain management education for internal medicine or family medicine training physicians.^{41,42} This review, however, plainly demonstrates that physicians feel their

training in pain management was inadequate for future practice. For example, Upshur and colleagues revealed that more than half of physicians feel residency training was insufficient with respect to pain management and as many as 81.5% believe medical school education was not adequate.²⁶ Several of the other articles in this review found similar results.^{29,30,32,35}

Although primary care physicians feel their training was inadequate, Breuer and colleagues found that primary care providers were the least likely to favor mandatory pain education compared to other practitioners who treat pain (chiropractors, acupuncturists, and pain physicians).²⁷ The American Academy of Family Physicians also released a position paper in 2012 stating they do not recommend requiring chronic pain CME training for family physicians as a prerequisite for Drug Enforcement Agency or other licensure due to potentially limiting patient access to pain management care.⁴⁰ Given that pain is already undertreated and consultation resources to pain specialists is limited this a valid concern. This does however, direct educational efforts towards medical school and graduate medical training that occur prior to full licensure as a physician. Although medical school is one avenue to improve the education of future physicians, residency training is where primary care physicians learn to prescribe medications and manage chronic conditions such as chronic pain. Scott and colleagues showed that a few basic educational interventions implemented during residency training for internal medicine residents improved their knowledge in pain management and their perception of training adequacy.²²

Lastly, because many physicians find patient encounters involving chronic pain frustrating and time consuming it is important to address educational efforts to improve physicians' attitudes toward those with chronic pain as well. Sullivan and colleagues yielded promising results in this regard after implementation of teaching a shared-decision making model

pertaining to opioids and chronic pain.²¹ Physicians in this study found the intervention provided less antagonistic patient encounters, increased use in pain medication agreements, and increased the focus on functional status.²¹

Bringing the Pieces Together

In the U.S. pain is linked to both the public health issue of under-treatment and the rising rate of prescription pain killer overdose deaths sweeping the nation. Improving provider education is paramount to address both issues, but doing so will require several steps. First, the medical community must establish straightforward guidelines for basic pain management and appropriate opioid use. This a crucial step before implementing any educational efforts because without standardized practice models, variation in prescribing habits and practice behaviors will remain high and continue to foster fear of regulation, frustration with chronic pain encounters, and anxiety when prescribing opioids. Second, the ACGME requirements for primary care residencies need to reflect the public health needs and realities of practicing primary care medicine in the U.S. by requiring formal education and training in pain management and opioid use. These requirements should involve training physicians to regularly engage in best practice behaviors when utilizing opioid medication such as administering urine toxicology screening, documenting a physical exam and treatment plan, and using pain medication agreements. Furthermore, educational efforts should also include promoting collaboration with patients to improve provider attitudes toward those with chronic pain. Third, given the ever-evolving body of medical knowledge it would be justified to explore better decision support systems to assist providers and advocate for patient safety. Decision support systems such as algorithms linked to electronic health records, prompts when prescribing opioids to reiterate best practices, or

warning flags when surpassing a high threshold of opiate dose as demonstrated by Washington State practices²⁴ would all assist physicians in adhering to best practices and promote safe use of opioid medications.

While provider education is only one piece of the driving effort to abate the epidemic of prescription drug overdose deaths in the U.S., it is central to every strategy addressing this issue. The FDA is attempting to strengthen surveillance efforts and as of 2011 44 states had prescription drug monitoring programs,⁴³ but only slightly more than half of physicians are registered with these programs.⁴⁴ Educating physicians to register and utilize these tools will improve surveillance and aid other agencies in their efforts. Moreover, primary care providers are strong voices in their communities. Arming them with the knowledge to promote safe practices regarding opioid use and address these issues in their community could help mobilize community efforts to confront this problem as well. As of April 2014 the FDA approved the opioid overdose rescue drug Evzio (a naloxone autoinjector) which primary care providers could now promote to patients and community members they feel are at risk or could utilize to assist others.³⁷ Finally, while changes in policy and increased regulation are powerful tools when implementing change across populations, this review illustrates such changes need to keep the concerns of providers in consideration. Specifically, this review has shown that regulatory issues are a major concern among primary care providers.^{27,29-31} Therefore, policy changes affecting regulation need to be cautious not to drive primary care physicians toward undertreating pain further and increasing their referrals to pain specialists.

Strengths and Limitations

The strength of this review is that the combined sample size is large, including over 1800 subjects and covers a range of practice settings from rural practice to a veteran's hospital and major academic centers. One of the major limitations of this review is that most of the studies were cross-sectional and do not show causality between opioid overdose deaths and provider attitudes and practices. Moreover, most of these studies were survey-based self-report studies, which may produce a bias in which the reported attitudes and practices of providers differ from their actual practice behaviors. Non-response bias is also a possibility in most of these cross-sectional survey-based studies with response rates as low as 10% reported in one study.³¹ Another key consideration is the gap between improving provider education and changing the mortality rate of prescription pain killer overdoses. Although improving provider knowledge and practice behaviors should have an impact on improving pain management and decrease the rate of prescription pain killer overdose deaths, there is no evidence in this review that educational efforts actually do improve patient outcomes in that regard.

Chapter 6 Conclusion

The results of this review demonstrate a strong need to increase the educational efforts regarding pain management and opioid use for the primary care work force in the United States. Pain management encompasses a large part of the primary care provider's practice and as such residency training is the most appropriate vehicle to improve the competency and practice behaviors of these providers.²⁶ The need for clear and concise guidelines, increased pain management specialists, and development of decision support systems to aid providers with opioid management is evident in this review and has been suggested in outside literature as well.^{40,45} The medical and legal communities need to work together in order to stop the struggle between the under-treatment of pain and patient safety by implementing policy changes that reflect the concerns of those providing pain management care to the populations around the United States. Further studies need to be conducted to evaluate the association between improved provider education and patient outcomes with respect to pain level and functionality, as well the adverse outcomes affiliated with opioid medications.

References

1. Paulozzi LJ, Jones CM, Mack KA, Rudd RA. Vital Signs: Overdoses of Prescription Opioid Pain Relievers -- United States, 1999-2008. *MMWR: Morbidity & Mortality Weekly Report*. 2011;60(43):1487-1492.
2. Global Industry Analyst Inc. *Global Pain Management Market to Reach US\$60 Billion by 2015*. 2011.
3. American Pain Society. Principles of analgesic use in the treatment of acute pain and cancer pain. 1999; <http://books.google.com/books?id=zNVsAAAAMAAJ>.
4. Wasse L, Ryan B, Kerns R, Drake A, Booss J. Pain as the 5th Vital Sign Toolkit. Washington, DC: Veterans Health Administration; 2000.
5. Steglitz J, Buscemi J, Ferguson MJ. The future of pain research, education, and treatment: a summary of the IOM report "Relieving pain in America: a blueprint for transforming prevention, care, education, and research". *Transl Behav Med*. 2012;2(1):6-8.
6. American Pain Foundation. *Voices of Chronic Pain*. American Pain Foundation;2006.
7. Centers for Disease Control and Prevention. *Unintentional Drug Poisoning in the United States*. 2010.
8. Hart PD. Americans Talk About Pain: A Survey Among Adults Nationwide Conducted for Research! America. 2003; <https://www.researchamerica.org/uploads/poll2003pain.pdf>. Accessed April 30, 2014.
9. Substance Abuse and Mental Health Services Administration. Results from the 2009 National Survey on Drug Use and Health: Mental Health Findings. Rockville, MD: Center for Behavioral Health Statistics and Quality. NSDUH Series H-39, HHS Publication No. SMA 10-4609; 2010.
10. Prevention CfDCA. CDC grand rounds: prescription drug overdoses-a US epidemic. *MMWR. Morbidity and mortality weekly report*. 2012;61(1):10.
11. Warner M, Chen LH, Makuc DM. Increase in fatal poisonings involving opioid analgesics in the United States, 1999-2006. *NCHS Data Brief*. 2009(22):1-8.
12. Centers for Disease Control and Prevention (CDC). Vital signs: overdoses of prescription opioid pain relievers and other drugs among women--United States, 1999-2010. *MMWR Morbidity and Mortality Weekly Report*. 2013;62(26):537-542.
13. Campbell CI, Weisner C, Leresche L, Ray GT, Saunders K, Sullivan MD, Banta-Green CJ, Merrill JO, Silverberg MJ, Boudreau D, Satre DD, Von Korff M. Age and gender

- trends in long-term opioid analgesic use for noncancer pain. *Am J Public Health*. 2010;100(12):2541-2547.
14. Hall AJ, Logan JE, Toblin RL, Kaplan JA, Kraner JC, Bixler D, Crosby AE, Paulozzi LJ. Patterns of abuse among unintentional pharmaceutical overdose fatalities. *JAMA*. 2008;300(22):2613-2620.
 15. Boudreau D, Von Korff M, Rutter CM, Saunders K, Ray GT, Sullivan MD, Campbell CI, Merrill JO, Silverberg MJ, Banta-Green C, Weisner C. Trends in long-term opioid therapy for chronic non-cancer pain. *Pharmacoepidemiol Drug Saf*. 2009;18(12):1166-1175.
 16. Robert Wood Johnson Foundation. Interactive: Prescription Drug Abuse. 2013; <http://www.rwjf.org/en/about-rwjf/newsroom/newsroom-content/2013/09/interactive--prescription-drug-abuse.html>. Accessed April 30, 2011.
 17. Mularski RA, White-Chu F, Overbay D, Miller L, Asch SM, Ganzini L. Measuring pain as the 5th vital sign does not improve quality of pain management. *J Gen Intern Med*. 2006;21(6):607-612.
 18. U.S. Food and Drug Administration. *Timeline of Selected FDA Activities and Significant Events Addressing Opioid Misuse and Abuse*. 2014.
 19. Glajchen M. Chronic pain: treatment barriers and strategies for clinical practice. *Journal of the American Board of Family Practice*. 2001;14(3):211-218.
 20. Russell DR, Hargus E, Trotta P. "Help--call the pain clinic". Opioid management for the nonspecialist. *Connecticut Medicine*. 2006;70(4):253-256.
 21. Sullivan MD, Leigh J, Gaster B. Brief report: Training internists in shared decision making about chronic opioid treatment for noncancer pain. *Journal of General Internal Medicine*. 2006;21(4):360-362.
 22. Scott E, Borate U, Heitner S, Chaitowitz M, Tester W, Eiger G. Pain management practices by internal medicine residents--a comparison before and after educational and institutional interventions. *American Journal of Hospice & Palliative Medicine*. 2008;25(6):431-439.
 23. Fagan MJ, Chen JT, Diaz JA, Reinert SE, Stein MD. Do internal medicine residents find pain medication agreements useful? *Clinical Journal of Pain*. 2008;24(1):35-38.
 24. Morse JS, Stockbridge H, Egan KB, Mai J, Wickizer T, Franklin GM. Primary care survey of the value and effectiveness of the Washington State Opioid Dosing Guideline. *Journal of Opioid Management*. 7(6):427-433.
 25. Clark JD. Chronic pain prevalence and analgesic prescribing in a general medical population. *Journal of Pain & Symptom Management*. 2002;23(2):131-137.

26. Upshur CC, Luckmann RS, Savageau JA. Primary care provider concerns about management of chronic pain in community clinic populations. *Journal of General Internal Medicine*. 2006;21(6):652-655.
27. Breuer B, Cruciani R, Portenoy RK. Pain management by primary care physicians, pain physicians, chiropractors, and acupuncturists: a national survey. *Southern Medical Journal*. 2010;103(8):738-747.
28. Dobscha SK, Corson K, Flores JA, Tansill EC, Gerrity MS. Veterans affairs primary care clinicians' attitudes toward chronic pain and correlates of opioid prescribing rates. *Pain Medicine*. 2008;9(5):564-571.
29. Green CR, Wheeler JR, Marchant B, LaPorte F, Guerrero E. Analysis of the physician variable in pain management. *Pain Medicine*. 2001;2(4):317-327.
30. Ponte CD, Johnson-Tribino J. Attitudes and knowledge about pain: an assessment of West Virginia family physicians. *Family Medicine*. 2005;37(7):477-480.
31. Nwokeji ED, Rascati KL, Brown CM, Eisenberg A. Influences of attitudes on family physicians' willingness to prescribe long-acting opioid analgesics for patients with chronic nonmalignant pain. *Clinical Therapeutics*. 2007;29 Suppl:2589-2602.
32. Bhamb B, Brown D, Hariharan J, Anderson J, Balousek S, Fleming MF. Survey of select practice behaviors by primary care physicians on the use of opioids for chronic pain. *Current Medical Research & Opinion*. 2006;22(9):1859-1865.
33. Potter M, Schafer S, Gonzalez-Mendez E, Gjeltema K, Lopez A, Wu J, Pedrin R, Cozen M, Wilson R, Thom D, Croughan-Minihane M. Opioids for chronic nonmalignant pain. Attitudes and practices of primary care physicians in the UCSF/Stanford Collaborative Research Network. University of California, San Francisco. *Journal of Family Practice*. 2001;50(2):145-151.
34. Remster EN, Marx TL. Barriers to managing chronic pain: a pilot of prescriber perceptions in rural Appalachia. *Journal of Pain & Symptom Management*. 2008;36(3):e1-2.
35. Darer JD, Hwang W, Pham HH, Bass EB, Anderson G. More training needed in chronic care: a survey of US physicians. *Academic Medicine*. 2004;79(6):541-548.
36. Nishimori M, Kulich RJ, Carwood CM, Okoye V, Kalso E, Ballantyne JC. Successful and unsuccessful outcomes with long-term opioid therapy: a survey of physicians' opinions. *Journal of Palliative Medicine*. 2006;9(1):50-56.
37. Hamburg MA. FDA Commission Margaret A. Hamburg Statement on Prescription Opioid Abuse. 2014;

<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm391590.htm>.
Accessed May 20, 2014.

38. Fisher FB. Evaluating the risks of unwarranted prosecution part 1: The criminalization of pain management. *Journal of American Physicians Surgeons*. 2004;9:114-117.
39. Chaitowitz M, Tester W, Eiger G. Use of a comprehensive survey as a first step in addressing clinical competence of physicians-in-training in the management of pain. *J Opioid Manag*. 2005;1(2):98-108.
40. American Academy of Family Physicians. *American Academy of Family Physicians Pain Management and Opioid Abuse: A Public Health Concern*. American Academy of Family Physicians;2012.
41. Accreditation Council for Graduate Medical Education. The Internal Medicine Milestone Project. 2012;
<http://www.acgme.org/acgmeweb/Portals/0/PDFs/Milestones/InternalMedicineMilestones.pdf>. Accessed May 18, 2014.
42. Accreditation Council for Graduate Medical Education. The Family Medicine Milestone Project. 2013;
<http://acgme.org/acgmeweb/Portals/0/PDFs/Milestones/FamilyMedicineMilestones.pdf>. Accessed May 18, 2014.
43. Gugelmann HM, Perrone J. Can prescription drug monitoring programs help limit opioid abuse? *JAMA*. 2011;306(20):2258-2259.
44. Fleming ML, Chandwani H, Barner JC, Weber SN, Okoro TT. Prescribers and pharmacists requests for prescription monitoring program (PMP) data: does PMP structure matter? *J Pain Palliat Care Pharmacother*. 2013;27(2):136-142.
45. Clark LG, Upshur CC. Family medicine physicians' views of how to improve chronic pain management. *J Am Board Fam Med*. 2007;20(5):479-482.

Vita

Sean Paschall was born in Denver, Colorado November 12, 1985 to parents Mark and Kathy Paschall. After graduating high school in Denver, CO Sean attended Rice University and received a Bachelor of Science in Bioengineering in 2009 as a magna cum laude graduate. He is a member of the 2014 class at the University of Texas Medical Branch in the combined M.D./M.P.H. program.

During his time at Rice he was involved with many community and health projects such as YMCA's outdoor lab camp and Engineers Without Borders in addition to serving as a volunteer emergency medical technician. While at UTMB Sean has been involved in school and community based events focused on student education and preventative healthcare. Sean served as a co-director of Student Liaisons to guide incoming medical students, director of Student Ambassadors for interviewing medical school applicants, as well as a director of Sir William Osler's Name That Book. Sean and a fellow classmate started this program in 2010 to instill a passion for self-directed learning and reading in third and fourth graders through mentorship from medical students. The program brought together several community members and four Galveston elementary schools in addition to a great number of UTMB members to mentor the kids and make reading enjoyable for them.

In 2012 Sean was inducted into UTMB's chapter of Alpha Omega Alpha in addition to the Gold Humanism Honor Society and received the American Medical Associations Physicians of Tomorrow Award. Sean plans pursue a career in anesthesiology and pain management with a focus on interventional approaches and prevention efforts. Sean will begin his internship at the Colorado Health Foundation in June 2014 and then finish his residency in anesthesiology at Stanford University.

Permanent address: 7903 West 62nd Way Arvada, CO 80004

This dissertation was typed by Sean M. Paschall