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Use of chart review tool and peer feedback to influence physician prescribing of controlled substances

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Thesis

**USE OF CHART REVIEW TOOL AND PEER FEEDBACK TO INFLUENCE
PHYSICIAN PRESCRIBING OF CONTROLLED SUBSTANCES**

by

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ABSTRACT

Purpose: Develop and evaluate a chart review tool (CRT) to improve the safety and effectiveness of prescribing controlled substances in a primary care setting.

METHODS: A Controlled Substance Review Committee, consisting of volunteer primary care physicians and a clinical pharmacist, developed a CRT to assess compliance with a primary care clinic's controlled substance prescribing policy and effectiveness of therapy. The CRT was based on existing clinic policies and American Pain Society/American Academy of Pain Medicine clinical guidelines for opioid prescribing. Every month, committee physicians used the CRT to review medical records of patients prescribed controlled substances chronically. The CRT tracked factors from the previous 6 months, including morphine equivalent dose (MED) prescribed, indication for treatment, documentation of treatment effectiveness, the Opioid Risk Tool score (ORT score), results from urine drug testing (UDT) and patient violations of the clinic's controlled substance policy. These findings are used to provide the treating physician constructive, non-punitive feedback. We also assessed if the use of the CRT resulted in change in MED prescribed.

RESULTS: Ninety-nine patient charts from 14 different physicians were reviewed over 1 year. Eighty-eight of these patients were receiving opioids for chronic pain, with an average dose in MED 72.6 mg/day (SD 89). Twenty-nine percent of charts had documentation that the controlled substance was improving the patient's quality of life or decreasing their pain. Sixty percent of patients had at least one violation of the clinic's controlled substance treatment agreement in the prior 6 months, and half of the violations were due to missed appointments with specialists to help manage pain. Patients were more likely to have a violation of controlled substance policy in the past 6 months if they were prescribed both a benzodiazepine (BZD) and an opioid ($p=0.04$), had a documented treatment agreement ($p=0.002$), or were high risk per ORT score ($p=0.001$). The mean dose of opioids, for the 88 patients who were prescribed opioids, decreased 2.6 mg/day MED from time of chart review until the end of study (mean duration 6.3 months), compared to a 6.9 mg/day MED increase that occurred from 12 months prior to chart review to the time of chart review ($p=0.01$).

CONCLUSION: Development and implementation of a CRT in an urban primary care clinic provided helpful insight on prescribing practices, and has promise to improve quality of opioid prescribing. The most common violation of the clinic policy was missed appointments with specialists, and patients prescribed both BZD and an opioid or were high risk per ORT were most likely to have violations. Documentation of effectiveness of therapy was lacking.

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LIST OF ABBREVIATIONS

APS/AAPM	American Pain Society/American Academy of Pain Medicine
BZD.....	Benzodiazepine
CRT.....	Chart Review Tool
IPV	Intimate Partner Violence
MED.....	Morphine Equivalent Dose
ORT.....	Opioid Risk Tool
PCP	Primary Care Physician
QI	Quality Improvement
UDT	Urine Drug Testing

INTRODUCTION

Background

According to the CDC, prescription opioid analgesic medications were responsible for 18,893 overdose deaths in the U.S. in 2014.¹ Heroin was responsible for 10,574 overdose deaths¹ and an additional 6,524 fatal overdoses resulted from prescription benzodiazepines (BZDs).² Eighty percent of first-time heroin users have previously misused prescription drugs, especially opioid pain medications.³ Additionally, it has been estimated that abuse of opioid analgesics in the United States result in more than \$55.7 billion in societal costs each year⁴, despite clear evidence that opioids are effective at treating chronic non-cancer pain.^{20, 21} The risk of adverse outcomes increases with escalating doses of opioids, with patients receiving >100 mg morphine equivalent dose (MED) /day having a nine-fold increased risk for overdose and an annual overdose rate of 1.8%.⁵ The risk of overdose with opioids is also increased by the addition of prescription BZDs.⁶

To address the growing epidemic of opioid abuse, a number of organizations have promulgated guidelines for opioid prescribing, which despite imperfect evidence, is a basis for standard of care and include monitoring suggestions such as urine drug testing (UDT) and treatment agreements.^{7,8} However, guidelines alone are ineffective in changing physician behaviors.⁹ Peer review and feedback have been used to increase guideline concordant care in other realms,¹⁹ and have potential to improve opioid prescribing. Studies have shown peer review and feedback can lead to improvements in physician practices, specifically when health professionals are not performing well at a

specific task, the individual providing the feedback is a colleague or supervisor, and the feedback is provided multiple times in a timely manner and the feedback includes clear targets in writing.¹⁹

In 2011, a family medicine clinic based at a large, urban academic safety-net hospital updated its existing controlled substance prescribing policy, which included a controlled substance treatment agreement form and other recommendations from existing guidelines. In 2013, a survey of 11 providers at the clinic suggested concerns for patients' safety when prescribing controlled substances. Concerns included:

- Inconsistency in prescribing practices
- Lack of adherence to controlled substance policy by physicians and by patients
- Unfamiliarity with existing guidelines
- A lack of time to properly assess patients
- A lack of empowerment to change opioid prescriptions and treatment plans begun by another provider
- A lack of non-pharmaceutical options to treat pain
- An electronic medical record system that made it difficult to manage patients

Based on these concerns, in August 2013 the clinic initiated a quality improvement (QI) project to improve the safety and effectiveness of prescribing controlled substances, including opioids and BZDs, through the use of a chart review tool (CRT). This paper describes the development, implementation and evaluation of a QI

project that features peer-review chart audit processes to improve controlled substance prescribing with a CRT. While this is not documented in the patient's chart, this could potentially be incorporated into the patient's chart in the future. We hypothesized that use of a CRT would lead to a decrease in the amount of opioid prescribed as it would flag potential misuse and give feedback to prescribers on safe practices, which include lower opioid doses.

Literature Review:

Widespread variation in opioid prescribing has been documented in a number of studies, including a study that reported a 10-fold difference in prescribing of opioids amongst different US states.²² Another study reported that the top 1% of prescribers for opioids in Delaware wrote one in four opioid prescriptions.²³ A brief and limited review of prescribing practices in our clinic showed similar variation in prescribing practices, and in some cases, variation in prescribing by provider differed by a factor of 10 in regards to the amount of opioids being prescribed (see figure 2 & 3).

Wide variation to prescribing of opioids may be in part due to lack of compliance with existing guidelines, or partly due to the ineffectiveness of the guidelines. Both of these issues may be contributing to the opioid epidemic, given recent concerns about the lack of evidence to support the existing guidelines⁷ and concerns that existing guidelines are difficult to implement in busy clinics.¹⁰ Research has shown limited compliance in following guideline recommendations, with one recent review of urine drug screens showing that only 8% to 30% of physicians who prescribe opioids for chronic pain obtained urine drug tests for those patients.¹⁴

While guidelines appear necessary to improving physician performance, they alone are not sufficient to improve this performance and local adaptation of the guidelines is needed for meaningful changes in physician's behaviors.²⁴ Practice guidelines have been historically difficult to implement in real-world clinical settings, in part because the development of guidelines are a highly centralized process, yet application of guidelines is a decentralized process done on a local level. And the research that is used to develop the guidelines comes from highly controlled research environments, which may be very different from the real-world settings that clinicians often work in. Research has identified a number of barriers that impede the implementation of clinical guidelines in real world clinical setting, which include lack of awareness,^{42, 43} lack of familiarity, lack of agreement,^{25, 42} lack of outcome expectancy (i.e. a physician may not think the guideline will improve outcomes), clinical inertia,^{25, 44} and external barriers, such as time limitations.²⁵ Specific barriers to implementing opioid prescribing guidelines have been identified, and they include inadequate time and resources, relying on general impressions of risk for opioid misuse rather than using validated measures, and viewing opioid monitoring as a "law enforcement" activity.²⁶

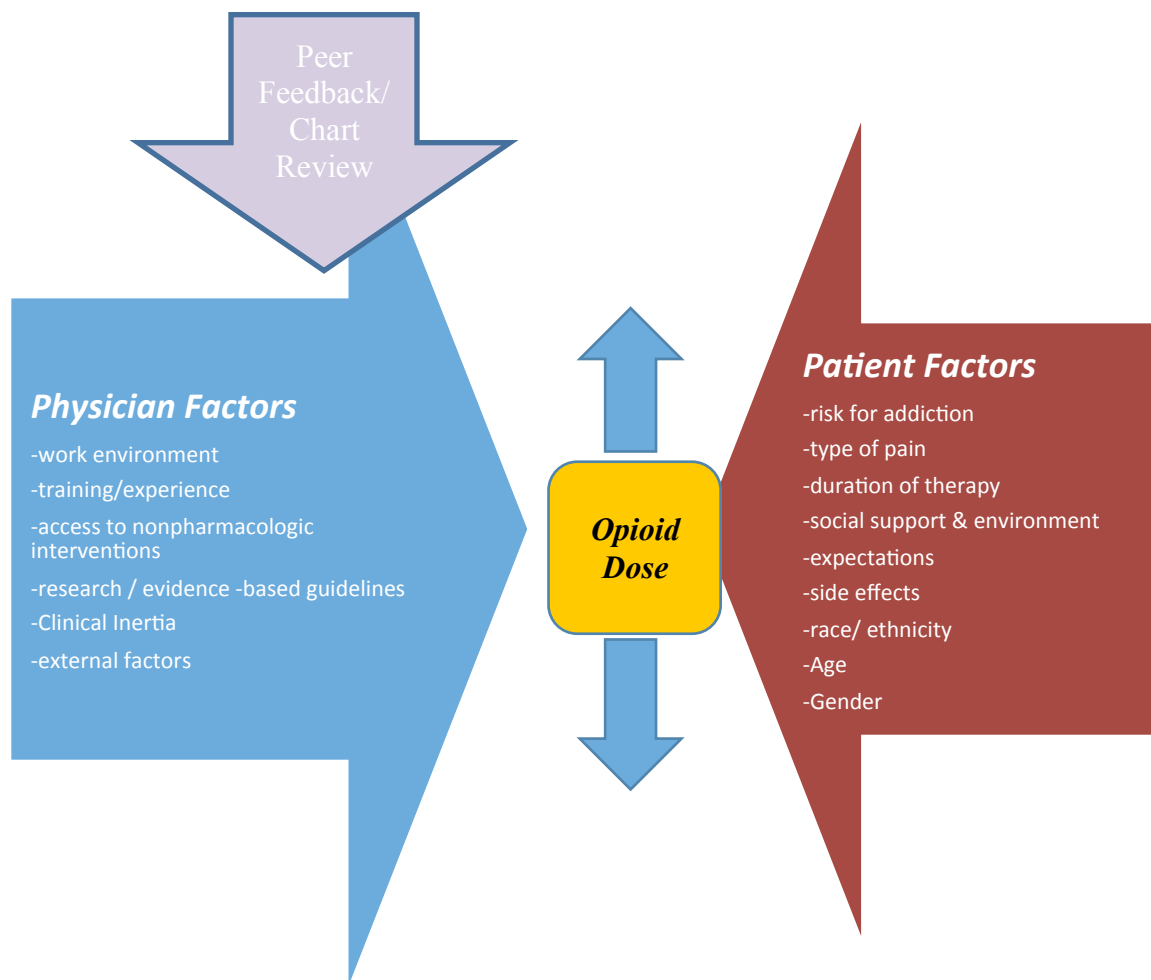
Providing medical education to physicians about clinical guidelines, through continuing medical education activities such as medical conferences, have historically been used to introduce clinical guidelines and can be done with minimal expenses, but most studies indicate they are of limited use in changing physician practices.^{27, 28} To have a meaningful impact on physician practices, interventions introducing clinical guidelines should involve real-time feedback to practicing physicians.^{29, 30} Peer review and

feedback, if done correctly, can provide such real-time feedback and can lead to improvements in physician practices, specifically when health professionals are not performing well at a specific task, the individual providing the feedback is a colleague or supervisor, and the feedback is provided multiple times in a timely manner, in writing or verbally, and includes clear targets and an action plan.¹⁹ This last part indicates that it is not good enough to tell someone that they are doing a good or bad job, but rather what they can specifically do to improve their performance. Hence, we decided to implement a chart review tool and peer feedback to physicians about patients they are actively treating as a way to increase knowledge and compliance with existing guidelines for opioid prescribing for chronic non-cancer pain.

CONCEPTUAL FRAMEWORK:

The amount of opioid prescribed by a physician is impacted by both physician and patient factors. Factors that may influence the physicians' prescribing practices include prior training, existing policies in the clinic that they practice, presence of evidence-based guidelines, a lack of non-pharmaceutical alternatives, a lack of time to properly monitor and assess patients, clinical inertia, and potentially external influences such as societal norms. Factors that may influence a patient to seek opioids for chronic pain, or higher doses of opioids, include a lack of pain control, addictive behaviors, environmental and genetic factors,⁴⁷ a lack of non-pharmacological alternatives,^{33, 34, 35} and untreated behavioral health issues.^{45, 46}

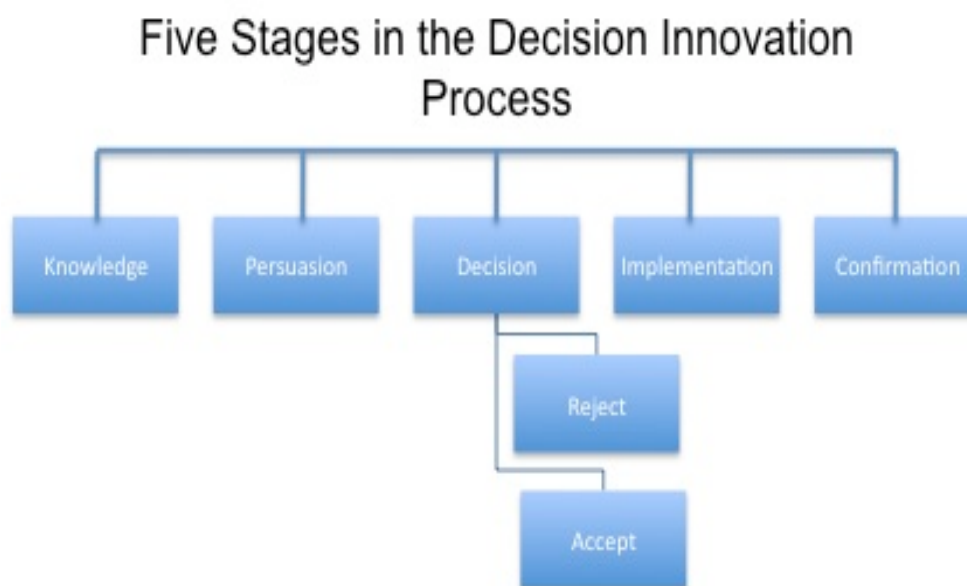
Figure 1a: Conceptual Framework: Factors that impact the Dose of Opioid: Use Peer Feedback/Chart Audit to increase knowledge of existing guidelines with hope to impact physician prescribing practices and decrease amount of opioids prescribed



The conceptual framework for our intervention (Figure 1a) involves “Diffusion of Innovations theory”, which suggests that the spread and adoption of new health behaviors, such as implementing clinical care guidelines, can be maximized by tailoring interventions to the individuals in the target population.³¹ Stages of the adoption process

for a new innovation such as a clinical guideline, per the diffusion of innovation theory, include knowledge (exposure to the innovation), persuasion (interest in knowing more about the innovation), decision (to adopt the innovation or not), implementation, and confirmation (Figure 1b). The speed of adoption is determined by the relative advantage of the new innovation, the compatibility, the complexity, the trialability, and the observability. Our chart review tool and peer feedback process will be used to increase the use of the clinical guidelines (i.e. the rate of diffusion of innovation) by providing the clinicians with a tool that is compatible with the work, that is easy to use (limited complexity), and we postulate will have a relative advantage by making the prescribing of opioids safer. The hypothesis related to this framework is that the clinical guidelines, which were introduced thru a chart review tool and adopted into practice by our physicians, will result in decreased opioid prescribing.

Figure 1b: Five stages in the Decision Innovation Process:



Objective: Develop a chart review tool to assess physician opioid prescribing practices and implement a process of peer feedback using the chart review tool.

Hypothesis: Peer feedback through the use of the chart review tool will result in a decrease in the change in the amount of opioids prescribed from time of chart review to the end of the QI project compared to the change in the amount of opioids prescribed 12 months prior to chart review to time of chart review.

METHODS

Study Design:

This was a clinical QI project, featuring a peer-led chart review, with a goal to improve the safety of controlled substance prescribing in a Family Medicine outpatient practice affiliated with a safety-net academic hospital. The project was evaluated by examining its impact on a key feature of safe prescribing, the amount of opioid (as expressed in MED) prescribed before and after chart review. In addition, process data and acceptability were analyzed to inform future implementation.

Development of the Chart Review Tool (CRT)

The committee consisted of eight volunteer clinicians and a pharmacist with goals to review the existing controlled substance prescribing policies and develop a peer review process to assess the effectiveness and safety of controlled substance prescribing, aided by a chart review tool (CRT). The committee took 4 months to complete the work through email communications and occasional in-person meetings. The CRT focuses on

assessing the 6 month period prior to time of chart review and is based on the existing controlled substance policy at the clinic and the American Pain Society/American Academy of Pain Medicine (APS/AAPM) guidelines.⁸ Reviewers were trained on how to complete the CRT during a departmental meeting and during one-on-one training sessions.

The content of the CRT is shown in Table 1, and includes the indication for controlled substance, amount of controlled substance prescribed, evidence of patient violation of controlled substance policy, presence of potential side-effects, and evidence of effectiveness. (See appendix for the complete tool). Amount of opioid prescribed was determined by entering opioid formulations into an online calculator¹² to determine the MED in mg/day. The CRT included the Opioid Risk Tool (ORT)¹¹ table, which calculates the risk for potential aberrant drug use behavior, such as overdose, misusing prescribed medications, diverting or selling of prescribed medication, or forging prescriptions.¹¹ The ORT score rates a patient as low (score <4), moderate (score between 4 – 7), or high risk (score >7) for these aberrant behaviors based on certain clinical factors, such as age and prior substance abuse issues. For this study, the ORT score was determined via available data in the chart review. As the tool was originally validated using face-to-face assessments to gather data,¹¹ the chart review method likely underestimates the ORT score.

Table 1: Data Retrieved Using Patient Chart Review Tool

Total amount of opiates prescribed, expressed as morphine equivalent dose (MED) per day.
Indication for opiate prescription
Risk of aberrant behavior based on the Opioid Risk Tool (ORT) ¹¹
Number of urine drug tests (UDT) in past 6 months
UDT results
Number of random controlled substance pill counts in past 6 months
Patient's compliance with the existing clinic controlled substance policy
Results from Massachusetts Prescription Monitoring Program (PMP)
Referrals to specialists or services, such as physical therapist, pain specialist, orthopedist, integrative medicine, rehabilitation medicine for the evaluation and treatment of pain
Whether patient arrived at appointment with specialist pain management referral
Potential side effects from prescribed treatment
Emergency room visits or related to indication for opiate use or opioid side effect
Hospital admissions related to indication for opiate use or opioid side effect
Evidence of improved functioning or quality of life

The CRT allowed the reviewer to provide general recommendations to the prescribing primary care physician for monitoring based on risk assessment or concerns for possible noncompliance. Those recommendations for monitoring included advice based on existing guidelines,⁸ such as frequency of urine drug screens or pill counts, or closer follow-up if there were concerns about non-compliance with the treatment plan (e.g. missing physical therapy appointments). To assess feasibility of implementation, reviewers documented time needed to complete the chart review with the CRT.

Implementation

This QI project took place from October 2013 to September 2014. The hospital clinical data warehouse, a single searchable database of electronic medical record systems throughout the hospital, provided a list of patients (aged 18 or higher) who had primary care visits at the clinic and were prescribed a controlled substance (defined as opioid analgesic medications, benzodiazepines, or amphetamines) monthly for at least 3 consecutive months during the 1 year period prior to time of request. From this list, charts were randomly selected for review. Each month, 2–4 volunteer physicians and pharmacists reviewed three charts each, specifically looking at the most recent six-month period.

The completed CRT form was then returned to the patient's primary care physician (PCP) with the intent to provide non-punitive, constructive feedback. The PCP was blinded to the identity of the chart reviewer, but the reviewer was aware of the identity of the PCP. The CRT information was not recorded in the patient's chart and

was not used for any administrative purposes. The completed CRT was destroyed via hospital protocol after review by the PCP.

Evaluation: Process and Outcome

Data for project evaluation included the data from the completed CRT, which was entered in a de-identified database before the CRT was given to the PCP. Other data from the electronic health record that was entered into the de-identified database included total duration of controlled substance therapy, insurance status, gender, race, distance patient lived from the clinic, and race/ethnicity. Distance patient lived from the clinic was assessed, using googlemaps to assess distance in miles, due to researchers noting a pattern of patients receiving higher doses of opioids tended to live further away from the clinic. Researchers recorded the amount of opioid prescribed in MED at three points in time, which were at twelve months prior to time of chart review, at time of chart review, and at completion of the QI project, which varied from 1–11 months (average 6.3 months) after chart review. These data were used to determine if there was a change in amount of opioids prescribed after a chart review was completed compared to prior to the chart review. For patients who had the controlled substance discontinued at the end of the QI project, a brief assessment of the chart was done to determine the reason for the discontinuation.

After completion of the QI project, our institution's Institutional Review Board granted approval to analyze the de-identified data set. Data were analyzed to describe the patient population on opioids using descriptive statistics and to assess if the QI project had resulted in differences in the amount of opioids prescribed before and after the chart

review process. SAS version 9.3 (SAS Institute, Cary, NC) was used for all statistical analyses. Comparisons of patients based on amount of opioid prescribed at time of chart review and number of violations of clinic policy in the prior 6 months was conducted by categorizing patients into three categories: (1) ORT score (low, moderate, or high risk); (2) BZD's prescribed in addition to opioids (yes/no); (3) whether or not there was clear documentation of a signed treatment agreement in the chart. Linear regression models were conducted to assess the association of various factors on amount of opioid prescribed. We used general linear models with interval scaled outcomes and for binary outcomes logistic models. For the dependent variables that were continuous we used ordinary least squared regression with selected interaction effects. The outcomes included total amount of opioid prescribed in morphine equivalents. The covariates adjustments in the model included: age, gender, race/ethnicity, insurance status (Medicare, Medicaid, private), duration of script, indication, opioid risk score, presence of BZD, number of violations, and distance from facility. Selected interactions included: opioid risk score with number of violations and initial dose of opioid. We note that the interactions were not significant in the models.

Time required to complete the CRT, the number of clinicians participating in the chart reviews process, and the number of physicians who had their charts reviewed were recorded. Feedback from participating physicians, both from those who participated by reviewing charts and by those who had their charts reviewed, was obtained by surveys sent to the physicians via email after completion of the QI project. These survey's consisted of open-ended questions asking for providers' feedback on the QI project and

whether or not we should continue to use the CRT. An in-depth analysis of the open-ended questions was not feasible due to the limited number of responses.

RESULTS

Ninety-nine patient charts were reviewed by 9 reviewers. Socio-demographics of the patients are shown in Table 2. Eighty-eight were prescribed an opioid analgesic and two died during the study period (one from active cancer and one of unknown causes). Of these, 16% were also prescribed a benzodiazepine. The remaining patients not on opioid analgesics were either receiving buprenorphine/naloxone (6%) or a benzodiazepine (4%). Of the 86 surviving patients on opioid analgesics, none had active cancer as an indication for therapy. The majority of patients were receiving opioids for low back pain (55%), chronic pain syndrome/fibromyalgia (15%), or arthritis (13%).

Table 2: Characteristics of Patients Prescribed Controlled Substances (n=99)*

Age, mean (SD)	52.25 (10.9)
Duration of therapy, months (SD)	60.9 (47.9)
	N
Female	55
Ethnicity / Race	
African-American	56
Caucasian	31
Latino	10

Asian	1
Unknown	1
Insurance	
Medicare (including dual eligible Medicare/Medicaid)	50
Medicaid only	41
Commercial	9
Type of controlled substance prescribed	
Opioid only	88
Low dose (<50 mg MED)	55
Medium Dose (≥ 50 mg and <100 mg MED)	13
High Dose (≥ 100 mg)	20
Benzodiazepine only	4
Both Opioid and Benzodiazepine	17
Buprenorphine	6
Tramadol	2

Opioid Doses

The average dose of opioid at time of review was 72.6 mg MED/day (SD 89) (Table 2). Twenty patients (23%) were receiving >100 mg MED/day. The average duration of opioid therapy was 61 months (SD 47.9). Caucasian patients received statistically significant higher doses of opioids than African Americans and Latino

patients [(112 mg/day (SD 111) vs. 57.1 mg (SD 80.6) and 59.1 mg (SD 46), respectively (p=0.04)] (Table 3). High-risk patients, based on ORT score, were prescribed higher doses of opioids compared to low-risk and moderate risk patients (114.3 mg/day (SD 89) vs. 56.1 (SD 77.8) and 78.3 mg (SD 106.2), respectively, p= 0.035) (Table 5). Patients with documented controlled substance treatment agreements in their charts had higher doses of opioids compared to those without treatment agreements documented (91.4 mg MED vs. 52 mg MED, p=0.04) (Table 5). Patients living more than 10 miles from our clinic were prescribed significantly more opioids than those who lived 10 mile or less from our clinic (107.4 mg MED vs 55 mg MED, p=0.04) (Table 5). Linear regression models indicate that dose of opioid was associated with duration of therapy (p=0.001) with the dose increasing 0.6 mg with each additional month of treatment in the 12 months prior to the intervention.

Table 3: Mean dose of opioids by ethnicity/race (n=88), MED* mg/day (sd)

	Mean (sd)
Total (n=88)	72.6 (89)
Caucasian (n=25)	112.0 (111.0)
African American (n=53)	57.1 (80.6)
Latino (n=9)	59.1 (46.0)
Asian (n=1)	96.0 (0.0)

Provider Practices and Patterns

Fifty-one percent (n=50) of patients had documentation of treatment agreements in their charts (Table 4). One patient had documentation of a random pill count. Less than one-third of patient charts documented any clinical improvement with controlled substance therapy, although there was wide variation in documentation practices.

Twenty-three percent of patients had documentation of symptoms consistent with known side-effects of the prescribed controlled substance, such as constipation, sexual dysfunction, or withdrawal symptoms.

Table 4: Provider Practices per Charts Reviewed (n=99)

Percentage of patients with Documented Controlled Substance Treatment Agreement in chart	50.1%
Percentage of patients with Urine Drug Screens (UDT) in past 6 months	
None	35.0%
1	20.5%
2	18.0%
3 or more	26.5%
Percentage of patients with UDT, with abnormal results (n=26)	41%
Amongst patients with abnormal UDT, patient with:	
• Prescribed drug missing (n=20)	77%
• Abnormal drug present (n=7)	27%
Percentage of patients with a random pill count in past 6 months	1%
Percentage of charts with provider documentation of decreased pain or improved quality of life	29%
Percentage of charts with provider documentation of symptoms that can be explained by possible side-effects from controlled substance	23%

At least one UDT was ordered in 63% (n=62) of patients in the 6 months prior to the chart review, for a total of 128 urine drug screens (Table 4). Of the patients who had a urine drug screen, 26 patients (41%) had at least one abnormal result. Twenty patients had at least one urine with the prescribed drug missing and 7 patients had abnormal drugs present (e.g. cocaine).

Physician action after a violation of the clinic policy, such as an abnormal UDT, varied. While not directly studied, reviewers noted significant variation in how physicians documented violations. For example, some physicians would document the violation (e.g. Violation #1) and/or note a change in treatment plan following violation, while other physicians would make no comment after a violation occurred. Of note, 5 patients who had abnormal UDT prior to the CRT but continued to receive the controlled substance had additional abnormal UDT after the CRT which resulted in the PCP discontinuing the controlled substance prior to the end of the observation period.

Although it was not part of the final analysis, early preliminary data suggested significant variation in prescribing practices amongst the participating physicians. A preliminary investigation of initial 35 chart reviews from 12 different providers showed that 24 (69%) of the charts reviewed were from just three physicians (figure 2), suggesting that these three physicians were prescribing controlled substances more frequently than the other providers. These findings were persistent after controlling for patient panel size (figure 3).

Figure 2 Percent patients receiving opioids per provider in Family Medicine Clinic

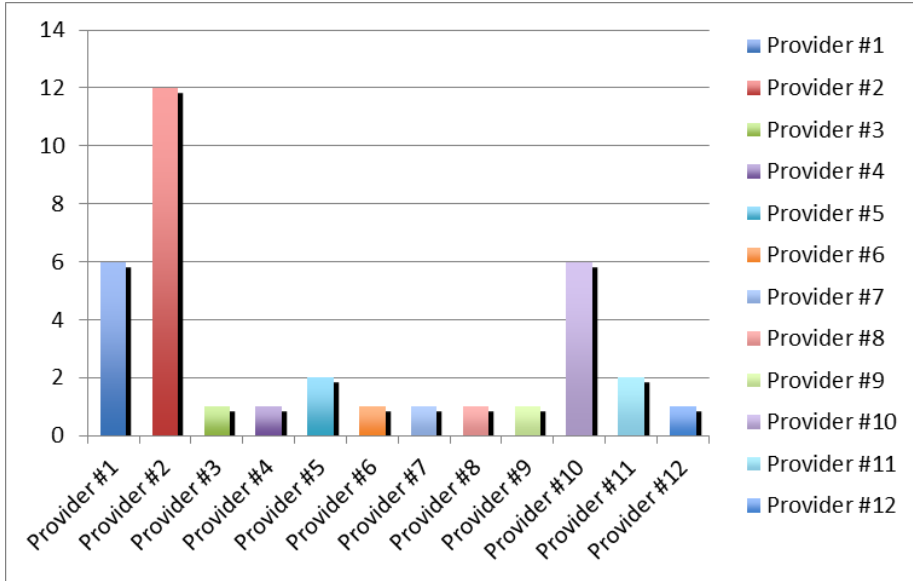
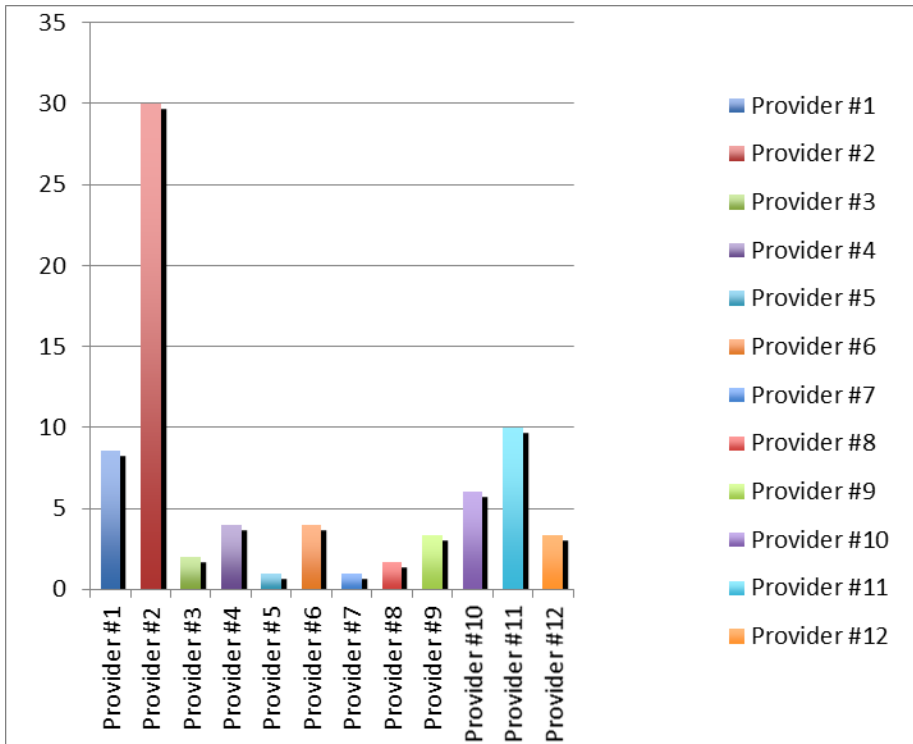


Figure 3: Percent patients on opioid per provider, controlling for sample size



Impact on Opioid Prescribing:

Over the 12 months prior to the chart review, the mean amount of opioid prescribed per day, in MED, increased 6.9 mg. In the period of time after the chart review (average 6.3 months), there was a 2.6 mg MED mean decrease in the amount of opioid prescribed ($p < 0.01$). Compared to patients with UDT as expected ($n=62$, average dose 64.2 mg MED), patients with an abnormal UDT ($n=26$, average dose 92.7 mg MED) experienced a significantly greater decrease in opioid dose after the chart review (-4.8 mg MED vs. -1.7 mg MED, $p < 0.005$). Both groups had a similar increase in the dose of opioids prescribed in the 12 months prior to the chart review (6.7 mg MED vs. 7.3 mg MED, $p=0.16$), during which time the results of the UDTs were available for the PCP for review. Longitudinal analysis did not show significant differences in total amount of opioids prescribed between the groups.

Patient Violations of Controlled Substance Policy

Amongst patients on opioids, 68% ($N=54$) had at least one violation of the clinic's controlled substance policy in the 6 months prior to chart review, including 33% missing scheduled appointments with specialists to help with pain management and 30% with abnormal UDT (Table 6). Twenty-eight percent of patients had multiple violations. High-risk patients, per ORT score, had more violations in the 6 months prior compared to medium and low-risk patients (2.2 vs. 1.4 and 0.9, respectively, $p=0.001$) (Table 5). Patients prescribed both an opioid and a benzodiazepine had more violations in the past 6 months compared to patients prescribed just an opioid (1.9 vs. 1.1, $p=0.04$) and higher ORT scores (5.6 vs. 3.3, $p=0.02$) (Table 5). Being prescribed both an opioid and a

benzodiazepine was associated with a higher likelihood of having an abnormal UDT (OR 3.0; $p=0.0003$). Patients with documented controlled substance treatment agreements also had a higher number of violations in the prior 6 months (1.7 vs. 0.8, $p=0.002$) (Table 5).

Table 5: Characteristics based on distance patient lives from clinic, presence of Treatment Agreement, Opioid Risk Score, and prescribing of Benzodiazepine

	n (%)	Ave MED (mg/day)	Viol past 6 months
Opioid Risk Score			
Low	50 (57%)	56.1 (77.8)	0.9 (1.2)
Moderate	21 (24%)	78.3 (106.2)	1.4 (1.2)
High	17 (19%)	114.3 (89)	2.2 (1.4)
Analysis of Variant		P=0.035	p=0.0015
Distance from clinic in miles			
• Near (<5 miles)	51 (58%)	56.2 (82.6)	1.3
• Moderate (5–10 miles)	8 (9%)	50.8 (75.3)	1.0
• Far (>10 miles)	29 (33%)	107.4 (96.3)	1.2
Analysis of Variant		0.04	0.8
Treatment Agreement			
• Absent	45 (52%)	52 (80.1)	0.8 (1.1)
• Present	43 (48%)	91.4 (93.4)	1.7 (1.4)
Analysis of Variance		P=0.04	P=0.002
Prescribed BZD & Opioid			
• Yes	16 (18%)	77.5 (100)	1.9 (1.5)
• No	72 (82%)	71.5 (87.4)	1.1 (1.2)

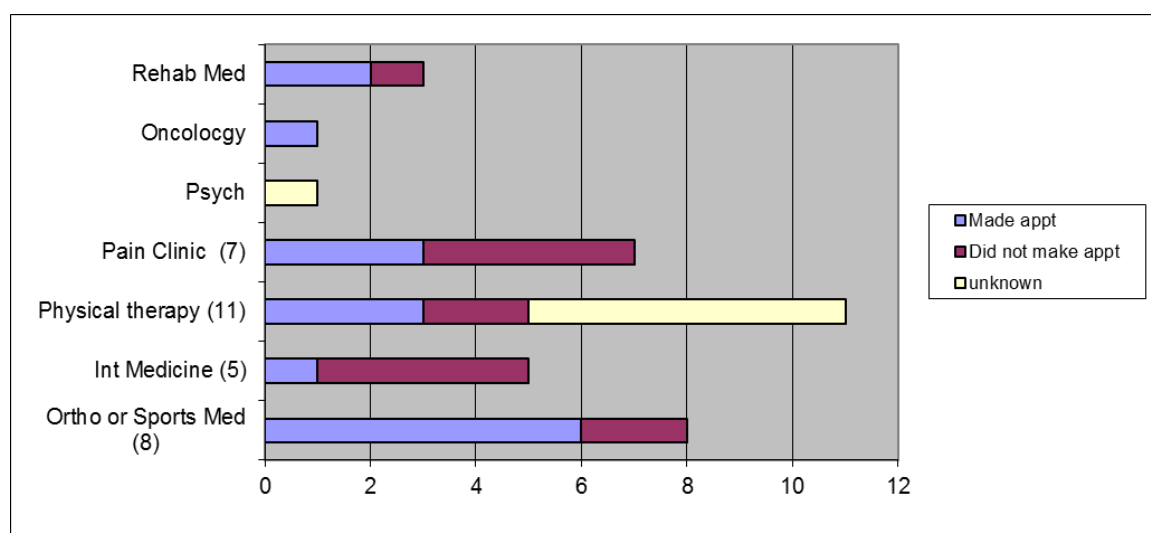
Table 6: Types of Violations in past 6 months

Percent of patients with Evidence of Violation of controlled substance policy in past 6 months	61%	
Type of Violation		
None	39%	
Missed Appointments with Specialist	33%	
○ Integrative Medicine		3%
○ Pain Clinic		8%
○ Orthopedics, Sports Medicine, Physical therapy		11%
Abnormal Urine Drug Screen	19%	
Missed Multiple PCP appointments	10%	
Getting Opioids from Outside Provider	8%	
Calling After hours for refills	2%	
Seek Early Refills	2%	
Lost Prescription	1%	
Disrespectful to staff	1%	
Increase Dose without PCP approval	1%	
Multiple Violations	28%	

When referred to a specialist to help address chronic pain issues, a preliminary assessment of the data indicated that patients clearly made it to their appointment in 44%

of the cases (Figure 4). In 36% of the cases, there was clear indication that the patient missed the appointment, and in 20% of the cases the data were not available to determine if the patient made the appointment or not. Patients were most likely to miss appointments with the pain clinic and with integrative medicine specialist. The information to confirm or deny if patients made their appointments with the physical therapist was mostly unavailable.

Figure 4: Attendance to referred Specialist



Physician Involvement:

Ten physicians and one pharmacist performed the chart reviews, and most reviewed 3–6 charts during the year. Fourteen physicians received at least one completed CRT. Average time to complete a single chart review was 13.5 minutes.

Informal feedback from participating physicians found the process of completing a CRT and receiving feedback constructive. Examples of the feedback received include:

- *“I read the review forms and found them extremely helpful. I would like to continue to receive feedback.”*
- *“This provides objective data on how often things have been done & whether things are well documented”*
- *“I think everyone should participate (on chart reviews” yearly or biyearly.. I think it will improve prescribing practices”*
- *“I have greatly benefited from it and would certainly support a standardized approach.”*

DISCUSSION

Developing and implementing a chart review tool (CRT) to assess controlled substance prescribing was feasible and showed promise for improving opioid prescribing practices. The CRT provided findings that can be used to improve prescribing practices, such as data about the types of violations to our controlled substance policy (e.g., missing appointments to specialists). In addition, the CRT provided clinically important information about the patient population, including characteristics of patients more likely to violate the controlled substance policy, such as those receiving both opioids and BZDs and those patients with high ORT scores. Furthermore, initial findings suggest the chart review tool has the potential to impact the total amount of opioids being prescribed, particularly among patients with abnormal UDT.

While it is not clear how representative this sample of physicians and patients is compared to other populations, the concerns noted by physicians in our clinic in the initial survey done in 2013 were similar to concerns documented by physicians in other

studies. Previous research shown, per the physicians, that the major barriers to safely prescribing opioids according to existing guidelines were inadequate time and resources, relying on general impressions of risk for opioid misuse, and viewing opioid monitoring as a “law enforcement”.²⁶ Our physicians clearly stated concerns about not having enough time, and also stated being unfamiliar with existing guidelines, which included using validity measures to assess for risk of opioid misuse.

In addition, our project, using a chart review process to determine ORT scores, found similar rates of high-risk patients on opioids (approximately 20%) as previous studies.¹¹ Our data showed Caucasian patients receiving higher doses of opioids than African American and Hispanic patients, which is consistent with earlier studies.^{15,16} Findings in this paper regarding variable use of UDT and treatment agreements and also that patients on higher doses of opioids are more likely to have a treatment agreement are corroborated by previous research.^{13, 14}

Of note, more than 50% of the violations of clinic policy were related to patients missing appointments to specialty services to help manage their pain, suggesting a need for further investigation. Previous studies on treatment agreements have documented that the most common reason for violation has been the presence of abnormal UDT and using opioids other than those prescribed.^{14,17, 18} The rate of non-compliance with specialty care which we observed has not been carefully examined among patients on controlled substances. This is particularly important given recent recommendations in the federal Interagency Pain Research Coordinating Committee’s (IPRCC) National Pain Strategy which emphasizes the importance of interdisciplinary treatments in treating chronic

pain.³² The IPRCC was developed by the Health and Humans Services agency to coordinate all pain research efforts. The documented poor attendance to these referred specialty services, such as pain specialists and integrative medicine specialists, by patients with chronic pain on controlled substances may warrant special attention given the limited availability of these resources in the general population, especially amongst under-served populations.^{33, 34, 35} Additional research should be done to explore ways to improve communication and coordination of care between specialist and primary care physicians, especially for patients who are prescribed controlled substances because missing these appointments may be a violation of their treatment agreement. More importantly, patients may be missing out on important therapeutic interventions that may improve their quality of life and decrease their dependency on the prescribed controlled substance.

Variations in opioid prescribing amongst physicians, as noted in our sample, have been previously documented. We chose not to include assessments of individual physician prescribing in the final analysis because the study was not designed for this purpose, although this may have been helpful in impacting prescribing practices. Research has shown providing physicians' reports about their individual practices compared to their peers can be effective in changing physician practices.³⁶ Nonetheless, targeting individual outliers may not be enough to curb the current opioid epidemic. Based on recent research, the 2013 Medicare claims data for schedule II opioids, shows that high-volume prescribers are not solely responsible for the current epidemic of opioid overdoses.³⁷

Evidence-based effective interventions are needed to improve controlled substance prescribing.^{7,10} Development of an easy to use and effective CRT has the potential to improve the safety and effectiveness of controlled substance prescribing. Our CRT process meets the criteria needed to provide effective feedback as noted by the Cochrane Review,¹⁹ specifically by having colleagues provide written feedback on an issue that our clinicians recognize is a problem. Although recipients of the CRT were not formally surveyed, the informal feedback suggests positive receptivity to this method. In addition, the costs for using the CRT were limited to the physician time to complete the CRT, which was on average 13.5 minutes per CRT completed. Future versions of the CRT could be more focused and less time intensive as we learn which aspects of the CRT are most useful to physicians and which aspects can be streamlined. Given the concerns that physicians have stated about a lack of time to assess patients on opioids,²⁶ and data suggesting these time constraints are real,³⁸ finding ways to decrease the amount of time to complete a CRT should be a priority. Possible future versions of the CRT process could target high risk patients as identified per Opioid Risk Tool, if they receive more than 100 mg MED, or receiving both opioid and benzodiazepines.

Additional risk factors for higher doses of opioids, as identified during our study, include living more than ten miles away from the clinic and being on opioids for longer periods of time. It may be that patients who live >10 miles from our clinic were traveling there because our clinic is based at tertiary care hospital, but it may also be that their previous providers who were closer to them had decided to stop providing them controlled substances. Additional research should be done to clarify why patients who

don't live in the immediate community visit those clinics for controlled substances.

Additionally, research should be done to explore the impact of duration of opioid therapy on patients, as there appears to be little research on this topic and hence, minimal guidance for primary care providers about the optimal duration of therapy. As our study has shown, the only factor that appears directly correlated, per regression analysis, with the amount of opioid prescribed was duration of therapy, with the amount of opioid increasing 0.6 mg MED for every month a patient was prescribed the opioid.

To develop better interventions to address opioid prescribing, we also will need to develop better metrics to assess effectiveness of treating chronic pain. At presents, there is limited evidence for the effectiveness of opioids for chronic non-cancer pain. In a systemic review of opioid treatment for chronic back pain,²⁰ the studies assessed were of a weak quality and with no significant evidence of benefit with chronic opioid therapy. In a Cochrane review of opioids for chronic non-cancer pain, the studies did find statistically better pain control with opioids than controls, but the pain relief was modest with wide variation in studies that were assessed and with no evidences of improvements in functioning or quality of life.²¹

Our chart review indicated only 29% of patients had any documentation that stated that the medication was helping to decrease pain or improve functioning. Evidence of clinical improvement when treating chronic pain is particularly difficult due to research that has shown that the chronic pain intensity, with the passage of time, is less associated with nociception but more related to emotional and psychosocial factors.³⁹ Hence, many of the interdisciplinary treatments recommended per the National Pain

Strategy focus on coping strategies with the goal to reduce suffering associated with chronic pain rather than strictly focusing on pain scores.³² However, we lack metrics to measure coping or suffering that can be used in primary care settings.

Additionally, more research should be done to explore the potential adverse events resulting from prescription opioids used to treat chronic non-cancer pain. Research states that the risk of addiction from prescription opioids for chronic pain is low, including a Cochrane review that reports only 0.27% of participants in the studies reviewed showed signs of opioid addiction,²¹ yet more than 18,000 people died from prescription opioid overdoses in 2014. These findings seem to be inconsistent with one another. Better understanding of the risk from these medications is needed, especially when considering research that shows patients believe their physicians should protect them from opioid-related harms and are more willing to participate in treatment agreements and urine drug testing when discussed as a way to protect them from harm.²⁶

Future research, using a randomized controlled trial, should be done to assess whether or not the chart review tool can be implemented in other settings and whether it improves prescribing practices. Previous researchers and clinicians have noted the need for developing patient-centered, brief, validated measures of patient-reported safety and efficacy.¹⁰ Such measures, if developed, would improve the CRT, which is presently limited to measuring changes in opioid doses or violations of controlled substance policy as the main outcomes. Additionally, clinical practices may wish to explore ways to improve communication between primary care physicians and specialists for patients on controlled substances, so that clinicians are aware when patients are not receiving

prescribed non-pharmacological means to treat their pain (such as physical therapy or integrative medicine interventions). Furthermore, there is unclear guidance about what to do when patients exhibit aberrant behaviors or are not clearly improving with controlled substance therapy. Finally, while our study focused on patient violations of the policy, we did not assess for individual physician compliance with the policy or individual prescribing practices. Future research should explore the role of physicians and healthcare systems in potentially unsafe prescribing of controlled substances.

Limitations to this QI project included a small sample size limited to one clinical site, lack of a control group, a quasi-experimental design with threats to the internal validity of the findings, such as recent data suggesting a plateau in opioid prescribing⁴⁰ and increased public media about the opioid epidemic that have gained their attention, and limited time duration of follow-up. Without a control group, causality cannot be determined. The small sample size limits the generalizability of this study. Reporting bias may exist with physicians reviewing one another, and recording bias may exist with incomplete documentation in the medical chart. Another limitation is that patients had various intervals from when the chart review occurred and when the project ended, hence it is hard to assess if there were significant changes post-intervention given that some chart reviews occurred 2 months prior to the end of project, while others had an entire year pass between the time of chart review and the end of the project. Additionally, ORT scores were calculated using the CRT, instead of patient self-assessment,¹¹ which likely underestimates the true ORT score.

Additionally, we could have used additional measures to assess the effectiveness of our chart review tool, either process (urine drug screens, treatment agreements, random pill counts) or outcomes (dose of opioids, side effects, ED visits, opioids from outside providers, abnormal urine drug screens). Nor did we allow revisions of the chart review tool, if we had more time, thru the use of “Plan-Do-Study-Act” change cycles typically associated with quality improvement projects.⁴¹

Conclusion

Providing feedback to physicians on controlled substance prescribing via a CRT has the potential to improve the safety of prescribing practices in a busy urban outpatient clinic of a safety-net hospital. The chart review tool can offer objective feedback based on existing guidelines in a non-punitive manner and may provide meaningful information to researchers about opioid prescribing practices. Further research is needed to assess which aspects of the chart review tool are most meaningful and whether these findings are generalizable to other clinical settings.

APPENDIX

CONTROLLED SUBSTANCE REVIEW FORM

Please:

- **Limit chart review to last 6 months.**
- Please document how time to complete form.

Medical record #

PCP being reviewed (initials):

What controlled substance? (Please circle, & write dose & amount of pills)

	Dose/amt of tabs per month:		Dose/amt tabs per mon
Oxycodone/Percocet		Fentanyl	
Morphine/MS contin		Suboxone	
Ativan/Lorazepam		Methadone	
Klonopin (Clonazepam)		Codeine/Tylenol 3	
Dilaudid (hydromorphone)		Vicodin (hydrocodone)	
Tramadol (ultram)		Flexeril	
Valium (Diazepam)			

Other: _____

Indication for controlled substance (i.e. back pain, fibromyalgia, etc.):

Number of PCP Clinic visits in past 6 months. Does not include phone contact or visits to other providers in ACC clinic.

Is there evidence of narcotic contract in the chart? (either narcotic contract printed at some point, or other evidence of discussion done?)

In the past 6 months, has the patient had the following done? If so, indicate the number of times.

- **Urine toxicology screen:**
 - How many: _____
 - Abnormal drug present? YES or NO. If yes, what drug? And how many times?
 - Prescribed drug missing? Yes or No? If yes, does chart document when patient reported last taking med prior to giving urine sample?
- **Random Pill Count?**
 - How Many? _____
 - If done, were the results normal or abnormal?

Assess risk of abuse:

What is the patient's Opioid Risk Score (based on best of your ability to determine)?

ITEM	MARK IF PRESENT	SCORE IF FEMALE	SCORE IF MALE
-Fam hx Sub Abuse			
-alcohol	[]	1	3
-illegal drugs	[]	2	3
-presc drugs	[]	4	4
-NOTHING DOCUMENTED	[]	0	0
-Personal hx of sub Abuse			
-alcohol	[]	3	3
-illegal drugs	[]	4	4
-prescript drugs	[]	5	5
-NOTHING DOCUMENTED	[]	0	0
-Age (<45 yo)	[]	1	1
+Hx of sexual abuse	[]	3	0
-NOT Documented	[]	0	0
-Hx Psych dz (ADHD, OCD, Bipolar, Schizophrenia)	[]	2	2
-Not Documented	[]	0	0
-Hx Depression	[]	1	1
-not Documented	[]	0	0
TOTAL SCORE			
LOW RISK 0–3			
MOD RISK 4–7			
HIGH RISK > 8			

RECEIVING >100 mg Morphine per day → Yes or No

(if yes consider HIGH RISK, because increase risk of mortality by 9x)

*** can use online converter: <http://www.globalrph.com/narcoticonv.htm> to calculate equivalent dose for different narcotics

*****APS/AAPM Recommends assessment by pain specialist if receiving >100 mg MED per day**

Based on the risk of abuse, consider potential monitoring strategies:

LOW RISK: urine tox 1–2x/year, consider random pill count yearly

MODERATE RISK: urine tox q 3 months, random pill count 1–2x/year

HIGH RISK: monthly &/or random urine tox, weekly scripts vs. monthly, 4–6 random pill counts/year, referral to pain specialist to review treatment plan

Has the patient been referred to additional services? If so, is there evidence patient made their appointment?

	Referral done	Made appt	Missed appt
Pain Clinic (Neuro)			
Integrative Medicine Pain Clinic			
Physical Therapy			
Anesthesia for steroid injection			
Sports Medicine			

Do you have access to the Mass Online Prescription monitoring program?

yes

no

If yes, has the patient received multiple prescriptions from different providers in past six months?

Yes

NO

If no, consider enrolling via website:

<http://www.mass.gov/eohhs/gov/departments/dph/programs/hcq/drug-control/ma-online-prescription-monitoring-program/>

Is the patient in violation of controlled-substance policy by any of the below items:

	YES	NO
Failing to arrived at scheduled follow-up appointments (either PCP or referred specialist)		
Failure to submit to requested urine testing or pill counts (or abnormal results on urine tox or pill count)		
Increasing dose of meds without discussing w. PCP		
Seeking early refills		
Calling after hours for refills		
Getting controlled substances from other healthcare providers without discussing with PCP		
Not treating staff respectfully		
Misrepresenting facts or failing to discuss info to providers		

OTHER:

If patient has violated narcotic contract, how many documented violations exist?

Is there evidence that the current regimen is helping control pain or improving quality of life? YES OR NO

Consider using PEG assessment

- Pain – decreasing pain?
- Enjoyment- better able to enjoy activities of life?
- General activity- improved activity levels?

Any side effects that could be potentially attributed to the controlled substance?

Consider problems below that can result from opioid prescribing

Constipation	Sexual dysfunction	Lethargy/somnolence
Nausea/vomit	Respiratory depression	myoclonus
Pruritis	Urinary retention	Withdrawal symptoms

Any admissions or ED visits? If so, how many and what for?

Is there a plan in place to stop or decrease dose of controlled substance in future?

SUMMARY:

Level of Risk based on Opioid Risk Tool: _____

Recommended Level of Monitoring: _____

Evidence of Violation of Narcotic Contract? _____

Additional Comments:

How much time did it take to complete this form?

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CURRICULUM VITAE

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Postdoctoral Training:

- 2013–Present Research Fellowship, Boston University School of Medicine, Family Medicine
- 2004–2007 Resident, Department of Family Medicine, Boston University (co-Chief during 2006–7)

Academic Training:

- 2016 M.S. Boston University, School of Public Health, Masters of Health Services Research (anticipated graduation May, 2016)
- 2004 M.D. Boston University School of Medicine, Boston, MA
- 1996 B.B.A. University of Massachusetts, Amherst, MA; Operations Management
- 1996 B.S. University of Massachusetts, Amherst, MA, Biology

Academic Appointments:

- 2011–Present Assistant Professor of Family Medicine, Boston University
- 2007–2011 Instructor in Medicine, Best Medical School

Hospital Appointments:

- 2010–2013 Assistant Inpatient Director for Clinical Education, Department of Family Medicine, Boston Medical Center
- Inpatient and Outpatient clinical work
 - Coordination of Inpatient teaching lectures for family medicine residents
 - Direct supervision of family medicine residents and medical students
- 2007–2010 Attending/Hospitalist, Dept. of Family Medicine, Boston Medical Center, Boston, MA

Honors:

- 2012 **Teacher of the Year**- awarded by graduating residents from BU Family Medicine Residency
- 2012 **Lynne Stevens Research Award for Research on Responding to Violence Against Women (2012)**- awarded to address gender-based violence (GBV) in Lesotho. With grant, we held multiple “Learning & Sharing sessions” throughout Lesotho for healthcare providers, developed curriculum on GBV/sexual assault for family medicine specialty program.

2012 **Leonard Tow Humanism in Medicine Award**, presented by the Arnold P. Gold Foundation, given to physician who demonstrate outstanding compassion, empathy, and respect towards patients and family members

2004 **William F. McNary Jr. Award**- chosen by graduating medical students from Boston University for having a proven record of service to the medical school, quiet leadership, fostering goodwill and excellence.

2004 **Leonard Tow Humanism in Medicine Award** presented by the Arnold P. Gold Foundation)- awarded to a graduating medical student who exhibited the most humanistic qualities.

2004 **Boston International Foundation for Medical Education Award (2004)**: awarded for having completed 2 month elective at foreign medical center during 4th year of medical school (funding used to travel to Vietnam).

Licenses and Certification:

2007 Massachusetts Licensure

2007 American Board of Family Practice

Departmental and University Committees:

2013–Present **Lynne Stevens Memorial Committee**: assist in selecting research grant proposals to address issues related to gender-based violence and help provide direction and oversight of these research projects

2011–2016 **Faculty Review Committee**- assess current faculty in BU Department of Family Medicine on department and individual goals and offer recommendations to help achieve those goals

2005– 2013 **Grand Rounds Committee**: coordinating BMC Department of Family Medicine weekly Grand Rounds

2000–2012 **Boston University School of Medicine Outreach Van Project**: Assist/Oversee medical student-run project that provides basic healthcare and needs (food, clothing, referrals) to the homeless of Boston.

Jan 2011 Laboratory Re-Engineering Focus Group, Boston Medical Center

2010–11 **Society of Hospital Medicine, Family Practice working group, 2010**

2004–2007 **BMC Committee of Interns & Residents Patient Care Fund Committee (9/04–6/07)** responsible for distributing >\$35,000.00 per year from CIR funds to various projects in the BMC community that improve patient care.

2001–04 **Student Representative for AAMC (2001–04):** elected by fellow class members to represent BUSM at AAMC conference

Additional Training awards:

August 2014 NIMHD Translational Health Disparities Course: two-week intensive course that provides introduction in the principles and practice of health disparities research, sponsored by the National Institute of Minority Health & Health Disparities

2014–15 Grant Generating Project (GGP): Thru Virginia Commonwealth University, and established through the efforts of the NAPCRG Committee on Building Research Capacity (BRC), the GGP seeks to equip family medicine researchers with the skills they need to successfully develop and submit grants for research funding

Major Administrative Responsibilities:

2010–2013 Assistant Inpatient Director of Clinical Education, Department of Family Medicine, Boston University

ORIGINAL, PEER-REVIEWED ARTICLES:

Jack B, Bickmore T, Hempstead M, Yinusa-Nyahkoon L, Sadikova E, Mitchell S, Gardiner P, Adigun F, **Penti B**, Schulman D, Damus K. Reducing Preconception Risks Among African American Women with Conversational Agent Technology. *J Am Board Fam Med.* July 2015; 28(4): 441–51

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Invited Lectures and Presentations

7th Annual Health Literacy Research Conference. Nov ’15, Bethesda, Maryland. Panel Discussion: Accessible and effective perinatal care for women with low health literacy skills: Intervention development, implementation and evaluation

21st Annual NRSA Research Trainees Conference. June ’15, Minneapolis. Brian Penti. Oral Presentation: Family Medicine Physician’s experiences with male patients who perpetrate Intimate Partner Violence, a Qualitative study.

21st Annual NRSA Research Trainees Conference. June ’15, Minneapolis. Brian Penti, Robert Saper. Chart Review tool to Improve Safety of Opioid Prescribing, results of 1 year QI Project.

Society Teachers of Family Medicine, Orlando, April 2015: Chris Manasseh, R Cancino, Brian Jack, Larry Culpepper, Brian Penti, Suzanne Mitchell. An enhanced model of teaching inpatient medicine to residents and students on an integrated multidisciplinary family medicine inpatient service meeting IHI's triple aim.

Academy of Violence and Abuse, Annual Conference, October '14, Salt Lake City: Brian Penti, Brian Jack et al. Relationship between Intimate Partner Violence and Other Preconception Health Risks in African American Women.

Brown University, International Health Grand Rounds, March 2013, "Sexual Assault & Gender Based Violence in Lesotho"

3rd WONCA Africa Regional Conference, Zimbabwe- Nov 2012 "Sexual Assault & Gender Based Violence in Lesotho: Survey results of healthcare providers experience dealing with victims of gender-violence"

AAFP Global Health Workshop, Minneapolis, Sept 2012- Addressing Issues related to care of victims of gender-based violence in Lesotho

Lesotho Medical Association, Maseru May 19, 2012- Care of Victim of Gender-Based Violence

Massachusetts Academy of Family Physicians Annual Update for Family Medicine Specialist, Boston Massachusetts, March 31, 2012- Peripheral Neuropathy: Assessment of Weakness, where there are no neurologist.

Poster Presentations:

Brian Penti, Joanne Timmons, Emily Rothman, Joanne Wilkinson. Family Medicine Physician's experiences with male patients who perpetrate Intimate Partner Violence, a Qualitative study. Society Teachers of Family Medicine, Orlando, April 2015

Brian Penti, Robert Saper. Chart Review tool to Improve Safety of Opioid Prescribing, results of 1 year QI Project. Society Teachers of Family Medicine, Orlando, April 2015

Brian Penti, Robert Saper. Variations between patients on high-dose opioids verse low-dose opioids for Chronic Non-Cancer Pain. Society Teachers of Family Medicine, Orlando, April 2015

Malope S, Limakatso E, Schumacher R, Jack B, Babich L, **Penti B**, Shaw K. Development of a Family Medicine Specialty Training Program (FMSTP) in Lesotho. Consortium of Universities for Global Health, 6th Annual Conference, March 26–28th 2015, Boston MA

Brian Pentti, Brian Jack et al. Relationship between Intimate Partner Violence and Other Preconception Health Risks in African American Women. National Institute Minority Health & Health Disparities Annual Conference, Dec '14, Washington DC

Brian Pentti, Brian Jack et al. Relationship between Intimate Partner Violence and Other Preconception Health Risks in African American Women. Society of Teachers of Family Medicine, Annual Conference, May '14, San Antonio TX.

Brian Pentti, Robert Saper. Controlled Substance Review Committee Using Standardized Chart-Review Tool to Improve Opioid Prescribing Patterns. Society of Teachers of Family Medicine, Annual Conference, May '14, San Antonio TX.

Brian Pentti, Josh Solomon. Treating non-communicable disease in rural Vietnam, project of WHO, Ministry of Health, and Hoi An Foundation. AAFP Global Health Workshop, San Diego 2011-

Other Professional Activities:

Professional Societies: Memberships, Offices, and Committee Assignments

2007 – Present American Association of Family Physicians

2007– 2012 Society of Hospital Medicine

2007– Present Massachusetts Medical Society

INTERNATIONAL HEALTH ACTIVITIES:

Lesotho Boston Health Alliance (Leboha) 2007– present: assisting in oversight and training of doctors in family medicine specialty program in Lesotho. Development of curriculum for gender-based violence & physician leadership. Prepare final test for registrar graduation.

Global Health Primary Care Initiative (2007 –2010) Boston University, Dept. of family medicine: Involved in direct clinical teaching in Ho Chi Minh and also in assistance in development of teaching website.

Medical Liaison/Director, Hoi An Foundation (2007 to 2012): non-profit organization in Central Vietnam, working with local physicians to improve health-care for chronic disease in rural areas. Activities include developing low-cost culturally appropriate interventions for the management of non-communicable diseases (hypertension, diabetes), which were used in central Vietnam and currently being implemented in numerous districts northern Vietnam as part of project sponsored by WHO. Articles related to work in Vietnam:

- http://www.wpro.who.int/vietnam/mediacentre/features/feature_world_diabetes_diy_2012_vietnam/en/index.html

- Tong, Sebastian, “Heart Failure in Vietnam”, *Fam Med* 2012; 44 (9): 656–7

La Paz, Bolivia (Bolivian Street Children Project): multiple visits since 2003–06, working with homeless street children and at a various health care institutes (including children’s hospital w/ local pedi cardiologist and at free care clinic), thru participation with Dr. Chi Huang from Boston Medical Center (www.bolivianstreetchildren.org)