REDESIGNING CHRONIC PAIN MANGEMENT IN PRIMARY CARE: IMPROVING COORDINATION, OUTCOMES, AND EXPERIENCE

Final Study Report

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Developed by:

Robert Romanelli, PhD, MPH
Palo Alto Medical Foundation Research Institute

Deborah Bronstein, MD
Palo Alto Medical Foundation, Managed Care Department

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1. ABSTRACT

Purpose: The Chronic Pain Management Redesign (CPMR) program is designed to educate healthcare providers on evidence-based management of non-cancer, chronic pain (CP); to develop electronic health records (EHR) tools, Shared Medical Appointments (SMAs), and web-based content to facilitate CP management; to evaluate the implementation and impact of the CPMR Program; and to disseminate findings, share best practices, and implement the program throughout the Sutter Health system.

Scope: This project was conducted within ambulatory clinics at Sutter Health.

Methods: We used descriptive analysis to conduct analyses. Patient-reported data from the SMA was examined using a pre-post study design and paired analysis for continuous (t test) variables.

Results: Educational boot camps were held in 4 divisions of the Palo Alto Medication Foundation (PAMF). We developed reports using real-time data from the electronic health records (EHR) to identify providers with disproportionately high numbers of patients on chronic opioid therapy (COT) or those with high morphine equivalent dosing to help focus our efforts and the efforts of physicians to mitigate inappropriate opioid prescribing and utilization. We have worked with PAMF and Sutter Epic champions to build and install an Epic smart-set to help providers manage patients with CP. There has been significant physician resistance to documentation. Feedback from providers indicates that smart-sets are difficult to use and are too time consuming. A preliminary evaluation of use of the smart-set corroborates this feedback in that utilization of the smart-set is suboptimal. More education and marketing may be needed around these tools.

We have implemented the first in a series of 3 shared medical appointments (SMA) on chronic pain. The goal of the first SMA is to educate patients on the risks and benefits of opioids. Our evaluation shows a favorable patient response in terms of improved confidence in self-managing pain, confidence in their healthcare providers to help them manage pain, and satisfaction with the care for pain at PAMF. These findings will lend support to continued expansion of SMAs to help patients understand and self-manage CP.

2. STUDY OVERVIEW

Objectives:

The primary objectives of the Chronic Pain Management Redesign (CPMR) Program were to educate healthcare providers on evidence-based management of non-cancer, chronic pain (CP); to develop electronic health records (EHR) tools, Shared Medical Appointments (SMAs), and web-based content to facilitate CP management; to evaluate the implementation and impact of the CPMR Program; and to disseminate findings, share best practices, and implement the program throughout the Sutter Health system.

Hypotheses:

We hypothesize that the CPMR Program will reduce and make opioid use safer; improve care coordination, patient outcomes, and patient and provider experience; and reduce healthcare costs.

Setting:

The CPMR Program was implemented in October 2015 at the Palo Alto Medical Foundation (PAMF), a multi-specialty ambulatory-care delivery network in Northern California, and a part of Sutter Health. PAMF has four administrative regional divisions (Palo Alto, Camino, Santa Cruz, and Alameda).

Target Healthcare Professional Population:

This program reached approximately 600 healthcare providers at PAMF, who prescribe opioid analgesics for non-cancer CP.

Target Patient Population:

The program has reached approximately 40,000 cumulative non-cancer CP patients and their caregivers, including those currently receiving opioid therapy and those who may be eligible for the treatment.

Intervention Components:

The CPMR Program is composed of:

- Continuing Medical Education (CME) accredited Boot Camps to *improve*:
  - Knowledge of current evidence-based best practices in CP management and guidelines on opioid prescribing
  - Providers' confidence in their ability to manage CP
  - EHR documentation and CP care coordination
  - Referral rates to pain specialists and SMA (shared medical appointments)
  - Use of non-pharmacological interventions;
  - Providers' *support* of patient empowerment in self-management
- Customized EHR tools to facilitate CP management, including point-of-car resources for *documentation* of pain intensity and functional scores, morphine equivalent dosing (MED), opioid abuse, medication safety agreements/pain contracts, and urine drug screening
- SMAs to help patients in understand benefits/risks of opioid treatment and to promote alternatives to pharmacological treatment, particularly opioid analgesics

3. RESULTS

3a. CME-ACCREDITED BOOT CAMP

Boot Camps were designed to educate providers on why the culture around treating CP needs to shift, to describe new opioid prescribing regulations put in place by the Medical Board of California (MBC), and to inform healthcare providers of new EHR tools that will help them better manage their patients' CP-related conditions. Two and one-half hours of CME credit were offered to attendees through the Sutter Health CME Department. A notary was provided on-site to notarize CURES applications. To engage providers in the educational session a real-time polling system was used. Attendees were able to text answers to the poll questions and responses could be immediately reviewed (polleverywhere.com).

Program Description

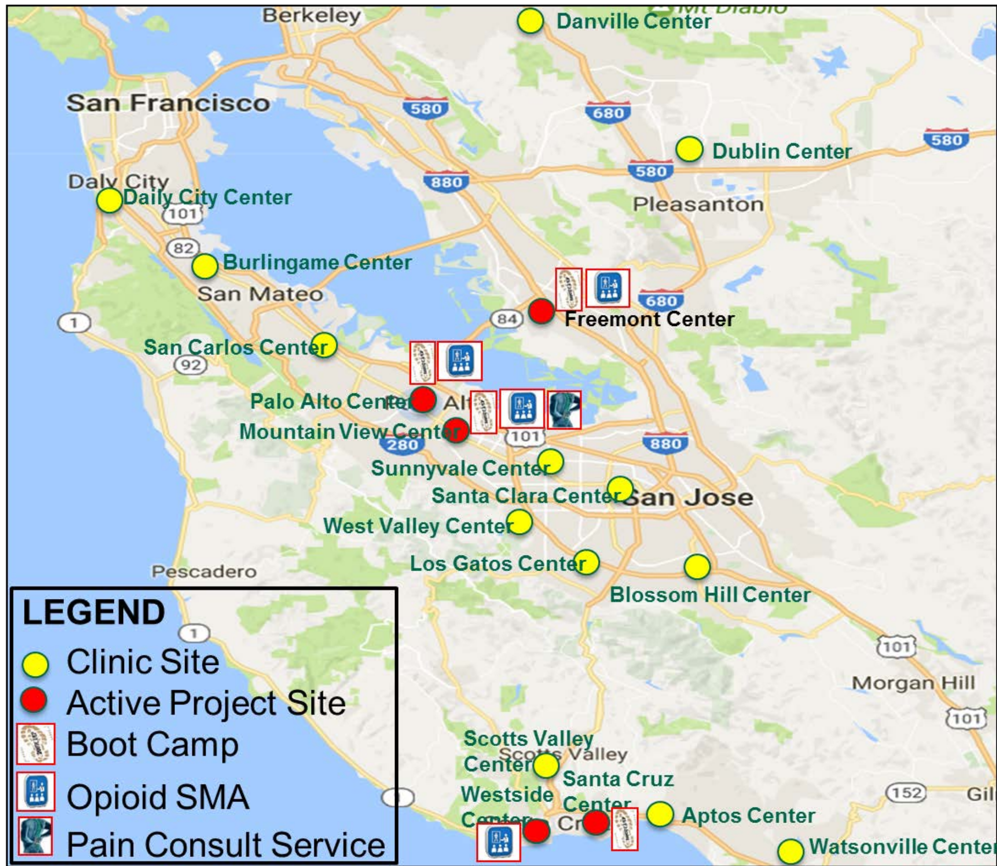
- Overview of the "opioid problem" in the U.S. and at Sutter Health and rationale as to why the culture needs to shift (presented by Dr. Deborah Bronstein)
- Why the traditional allopathic approach to the management of CP does not work; how an alternative, multidisciplinary approach to CP management is better; and returning the locus of control to the patient (Dr. William Brose, pain expert)
- How a pain psychologist and physical therapist fits into the overall management of a patient with CP (Brose Team)
- Changes to the MBC regulations on opioid prescribing (Dr. Brose)
- Overview of EHR tools, including assessment of opioid abuse risk, documentation of pain and functional interference scores, completing pain contracts, ordering urine drug screens, calculation of MED (Dr. Bronstein)
- EHR tools tutorial (Dr. Henry Thai, Epic EHR Physician Champion)

A formative evaluation survey of the Boot Camp was distributed to attendees the day after the event. Among 123 attendees, 92 completed the questionnaire (75%). Responses from participants from each of the Boot Camps were used to improve the delivery of content for subsequent events. Overall, feedback from the Boot Camps was favorable, the majority of attendees found the material relevant to their practice and believed it would help them better manage CP patients. The most frequently cited challenge to implementing the proposed changes to clinical practice, including use of EHR tools, was lack of time (54% of responders).

Six-month follow-up questionnaires were completed by 23 of 123 providers (19%). Overall, responses were favorable with nearly 40% of respondents reporting a "significant or very significant increase" in understanding of managing chronic pain. However, providers report that the smart-set is too time-consuming and complicated to use during a routine office visit.

In total, 400 providers attended 4 Boot Camps throughout PAMF.

Figure 1: Reach of the Boot Camps



Challenges:

- Overall, boot camp did not reach as many providers as we would have liked
- Return rate of the follow-up survey was low (<20%), complicating the interpretation and generalizability of responses

Opportunities:

- There is demand more information around the CP tools (smart-set) at PAMF and throughout Sutter Health, which can be a way to reinforcing the educational content of the boot camps
- Responses provided from providers indicate opportunities to improve the user experience of the smart-set

3b. MONTHLY OPIOID PRESCRIBING REPORTS

We generated reports to track the impact of the CPMR program on opioid prescribing patterns. We have collected 12 months of data prior to program implementation (October 2014 through September 2015).

Cohort Inclusion Criteria

- Patients ≥18 y/o at time of medication order

Cohort Exclusion Criteria

- Encounter or problem list diagnosis for a malignant neoplasm (**ICD-9:** 140-239; or **ICD-10:** C00-D49) in 6 months prior;
- Cancer treatment in 6 months prior: Chemotherapy (**ICD-9:** 99.25; or **ICD-10 PCS:**3E03305, 3E04305, XW03351, XW04351) (**CPT:** 96401-96450, 96542, 96549); Radiation therapy (**ICD-9:** 92.21-92.29; **ICD-10 PCS:** starts with "D") (**CPT:** 77401-77402, 77407, 77412)
- Palliative care (**ICD-9:** v66.7; or **ICD-10:** Z51.5) (**CPT:** 99495, 99496) in 6 months prior

Medication Inclusion Criteria:

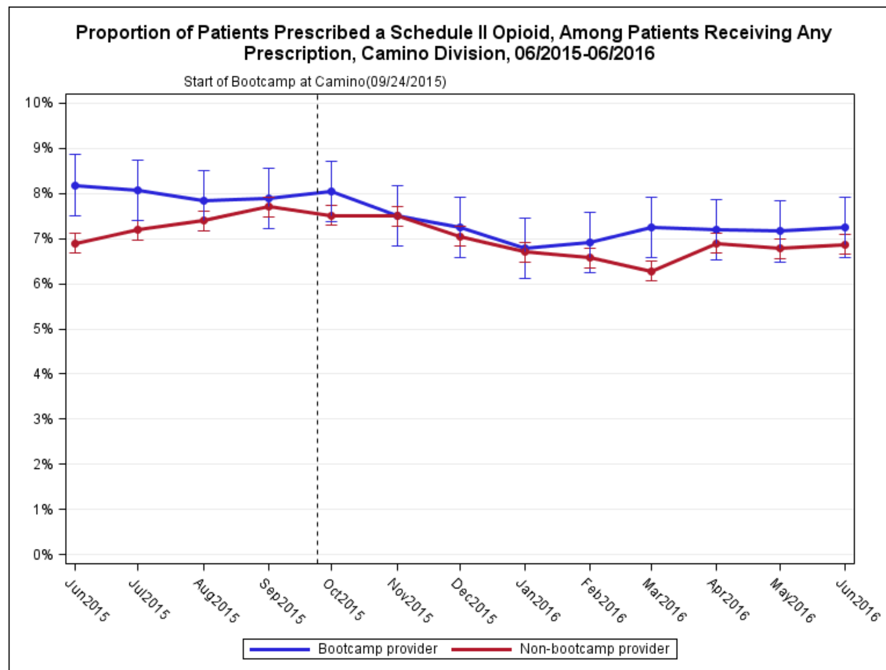
- Oral medications (**Table 2**)

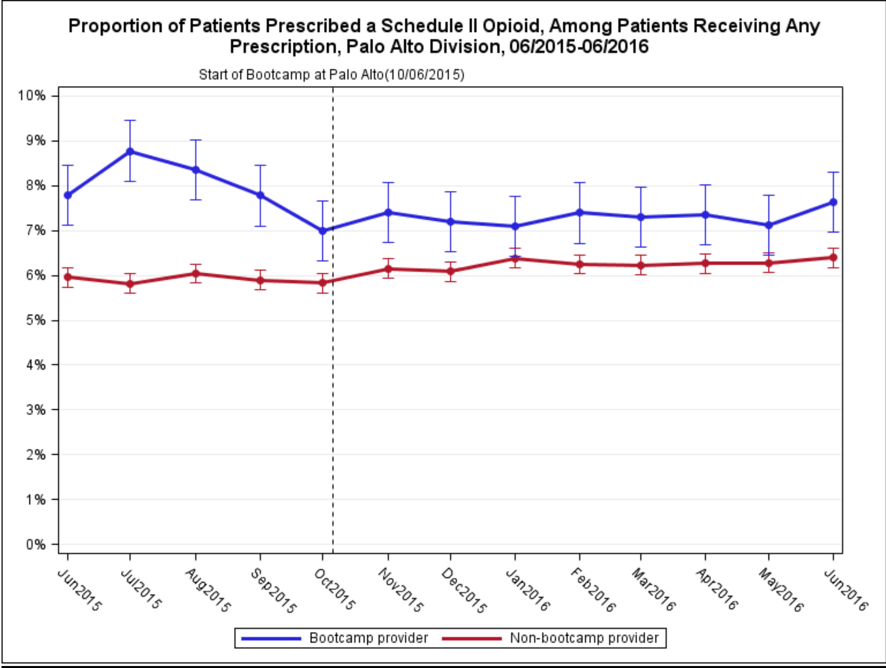
Table 2. Medications of Interest	
Schedule II	Codeine, oral (when not combined)
	Hydrocodone, oral
	Hydrocodone, oral in combination: Vicodin® , Lortab® , Lortab ASA® , Hycomine® , Vicoprofen®, Norco®
	Hydromorphone, oral: Dilaudid®
	Meperidine, oral: Demerol®
	Methadone
	Morphine, oral: MSContin® (morphine if not combined)
	Oxycodone, oral: OxyContin® , Percocet® , Percodan®
	Oxymorphone: oral, Numorphan®
	Hydrocodone Bitartrate

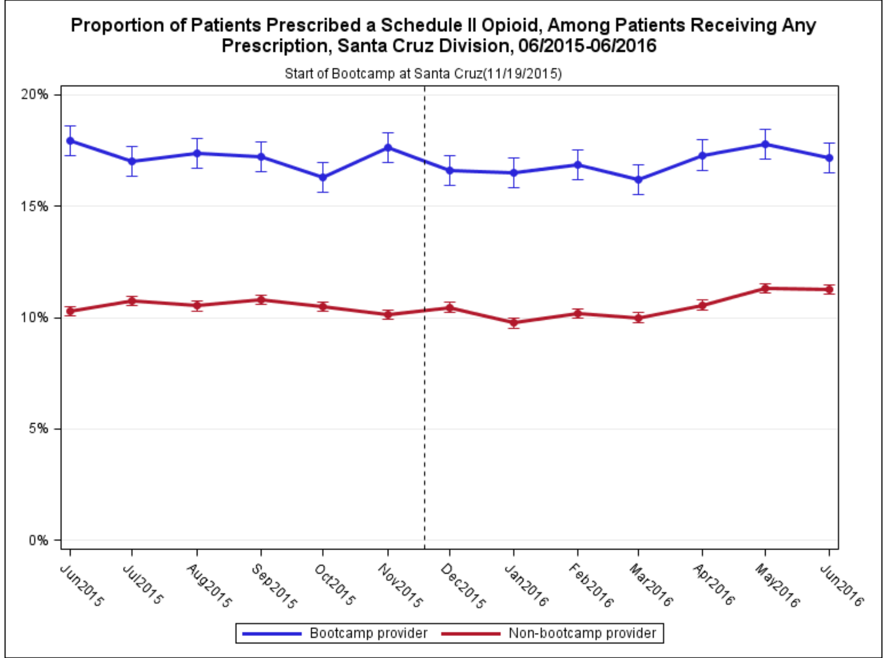
	Tapentadol HCl
	Levorphanol Tartrate
Schedule III	Codeine (when mixed with aspirin or acetaminophen) -- Tylenol #3®
	Butalbital-APAP-Caff-Cod
Schedule IV	Pentazocine-Naloxone
	TraMADol HCl

Tracking of schedule II opioid prescribing is shown in **Figure 1** on the next page. In the *Camino Division* (**Figure 1**, top panel), there was little overall difference in the proportions of patients who were prescribed schedule II opioids by providers who attended the boot camps vs. those who did not. From June 2015 through June 2016, the rate of opioid prescribing has decreased similarly, albeit slightly, for boot camp and non-boot camp providers in the *Camino Division*. In the *Palo Alto Division*, opioid prescribing was higher among boot camp providers vs. non-boot camp providers before the boot camp; among boot camp providers there was a decrease in opioid prescribing that started well before the boot camp (**Figure 1**, middle panel). In the *Santa Cruz Division* (**Figure 2**, bottom panel), boot camp providers consistently had a higher proportion of patients receiving schedule II opioids than non-boot camp providers. There appeared to be little to no change in opioid prescribing for either group over time.

Figure 2. Patients Prescribed a Schedule II Opioid as a Proportion of All Prescriptions Written. Camino (top panel), Palo Alto (middle panel), Santa Cruz (bottom panel). Error bars represent 95% binominal confidence intervals.




Proportion of Patients Prescribed a Schedule II Opioid, Among Patients Receiving Any Prescription, Palo Alto Division, 06/2015-06/2016
Start of Bootcamp at Palo Alto(10/06/2015)
10%
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
Jun2015
Jul2015
Aug2015
Sep2015
Oct2015
Nov2015
Dec2015
Jan2016
Feb2016
Mar2016
Apr2016
May2016
Jun2016
Bootcamp provider
Non-bootcamp provider


Proportion of Patients Prescribed a Schedule II Opioid, Among Patients Receiving Any Prescription, Santa Cruz Division, 06/2015-06/2016
Start of Bootcamp at Santa Cruz(11/19/2015)
20%
15%
10%
5%
0%
Jun2015
Jul2015
Aug2015
Sep2015
Oct2015
Nov2015
Dec2015
Jan2016
Feb2016
Mar2016
Apr2016
May2016
Jun2016
Bootcamp provider
Non-bootcamp provider

We leveraged this report to create an additional report of Chronic Opioid Therapy (COT) by morphine milligram dosing (MED) risk level. COT was defined as at least 90 consecutive days with an opioid prescription. Approximately 25% of the 3,745 patients identified as being on COT were on doses of opioids deemed to be high risk (**Figure 3**). These findings were translated into a proto-dashboard for individuals physicians for variation reduction efforts at our organization (**Figure 4**).

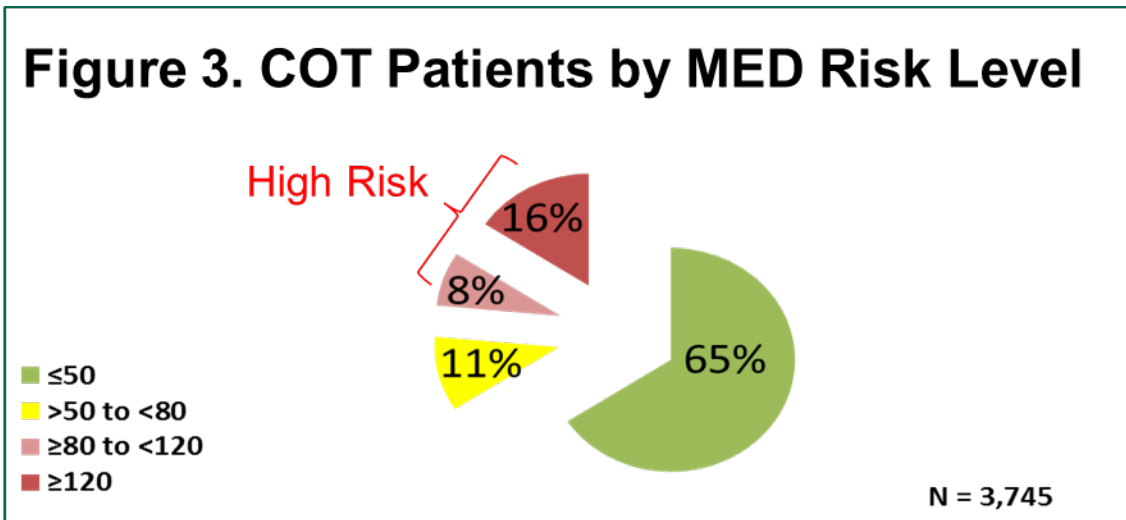


Figure 3. COT Patients by MED Risk Level

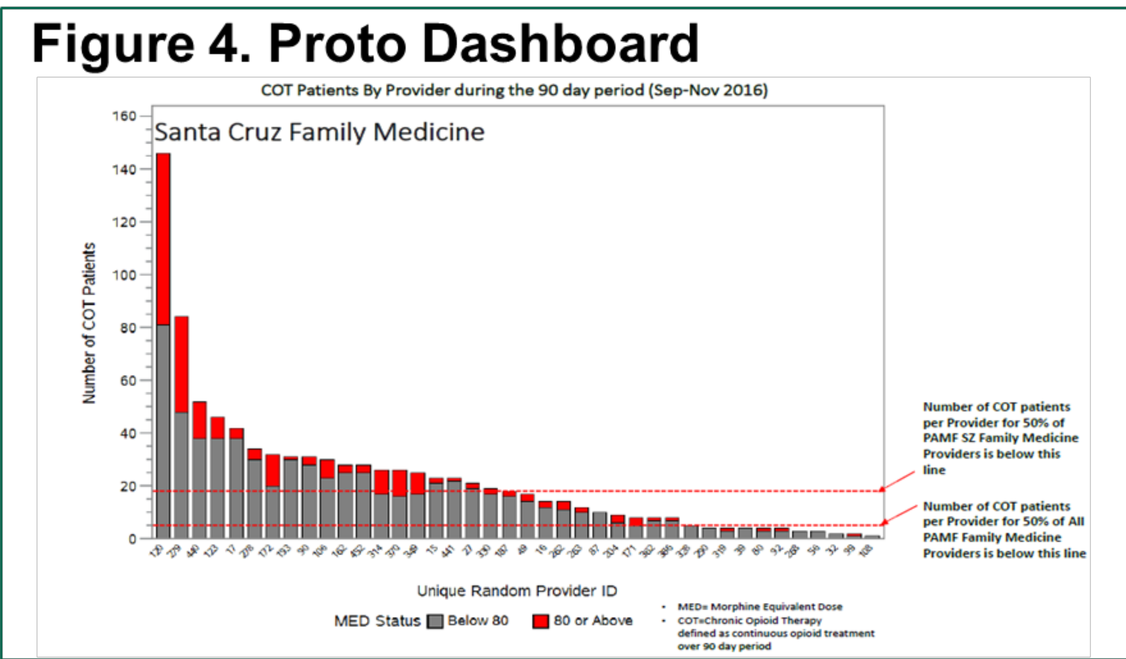


Figure 4. Proto Dashboard

Challenges:

- Comparisons across PAMF Divisions are confounded by different underlying patient populations (for example, Santa Cruz has a larger Medicaid population than the other divisions, which may contribute to higher opioid prescribing levels)
- Decreasing trends in opioid prescribing in Camino and Palo Alto may be due to heightened awareness of efforts to curb inappropriate prescribing and not the boot camp, itself (explaining concomitant decreasing prescribing among the non-boot camp providers or decreases in opioid prescribing among boot camp providers in the months prior to the boot camp)

Opportunities:

- These data point to divisions, namely Santa Cruz, in which more work needs to be done around opioid prescribing

3c. CUSTOMIZED EHR TOOLS

We have worked with Dr. Henry Thai, Epic EHR Physician Champion at PAMF, to develop point-of-care resources for CP management. Preliminary tools were built in September 2015 for assessment of opioid abuse risk, documentation of pain and functional interference scores, completing pain contracts, ordering urine drug screens, calculation of MED. The Epic User group at Sutter Health built upon these preliminary tools and developed a smart set that can be used throughout the Sutter Health system (**Figure 5**). The smart set has been available since March 2016. Training modules are available to help physicians use these resources efficiently.

Figure 5. Chronic Pain Smart Set Screen Shot

Mult Vitals | Asthma | Amb Prenatal Vitals | Pain Scales | PAIN MANAGEMENT

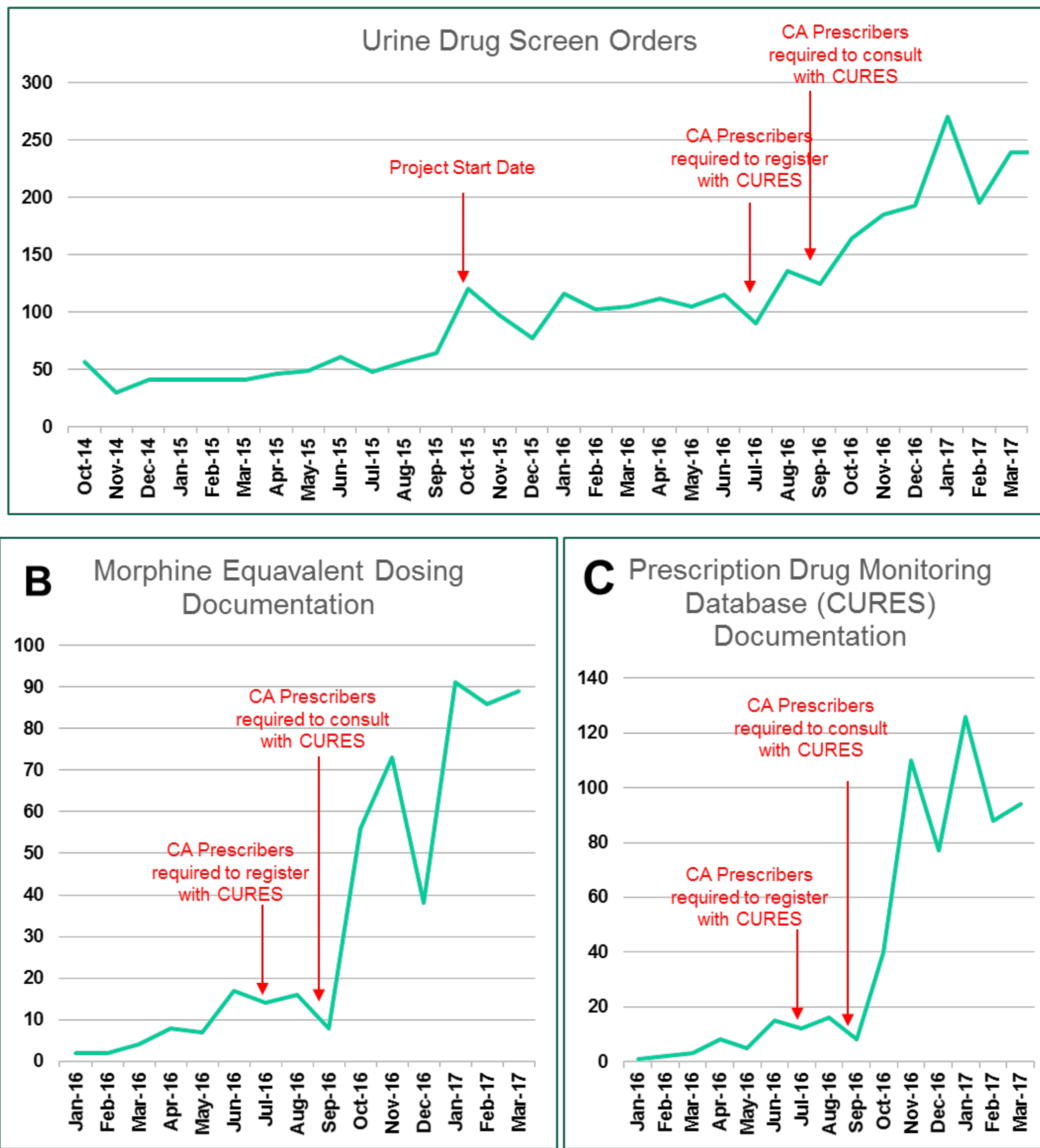
Mode: Accordion | Expanded | View All — Reset Now

	1/22/16 1600
Opioid Risk Tool	
ORT Date Completed (once)	
Informed Consent	
Date Informed Consent Provided (once)	
Pain Management Agreement	
Date Pain Management Agreement Signed (yearly)	
Urine Drug Screen	
Date Urine Drug Screen Last Completed (2-3 times a year)	
CURES Report	
CURES REPORT DATE	
PEG TOOL (every visit)	
PEG Pain (0-No pain, 10-pain as bad as you can imagine)	
PEG Enjoy Life (0-Does not interfere, 10-completely interferes)	
PEG General Activity (0-Does not interfere, 10-completely interferes)	
MED Calculator	
Codeine Total Daily Dose in mg	
Fentanyl Total Daily Dose in mcg	
Hydrocodone Total Daily Dose in mg	
Hydromorphone Total Daily Dose in mg	
Methadone Total Daily Dose in mg	
Morphine Total Daily Dose in mg	
Oxycodone Total Daily Dose in mg	
Oxymorphone Total Daily Dose in mg	
Tapentadol Total Daily Dose in mg	
Tramadol Total Daily Dose in mg	
MED SCORE	

Physician champions (Drs. Stephanie Wong and Henry Thai) have demonstrated smart-set tools to smaller audiences at multiple primary-care department meetings between January and March 2016. Anecdotal reports indicated that physicians may not have been ordering urine drug tests because they didn't know exactly how to interpret results. Thus, we have developed a Urine Drug Test FAQ, which is available on the PAMF intranet for providers, and has been loaded into the smart-set as a link. The FAQ document also includes a link to recent Centers for Disease Control and Prevention opioid prescribing guidelines.

We examined provider utilization of the smart tools over time. Urine drug screening (**Figure 6A**) increased with the start of project and implementation of state regulations. MED documentation (**Figure 6B**) and CURES consults (**Figure 6C**) increased with implementation of state regulations.

Figure 6. EHR Process Measures (counts)



Challenges:

- Availability of tools does not necessarily mean that physicians will use them
- Significant physician resistance to doing documentation: feedback from providers indicates that smart-sets are difficult to use and are too time consuming

Opportunities:

- Preliminary findings suggest that more education and marketing is needed around these tools, especially among providers who did not attend a boot camp
- Develop other resources, such as SMAs (for informed consent) and use of pain consultants in PAMF (for risk assessment, CURES, UDT, and advising to the importance of a pain contract) to assist primary-care providers (additional non-physician resources, such as pharmacist nurse practitioner, may be available to help)

3d. SHARED MEDICAL APPOINTMENTS

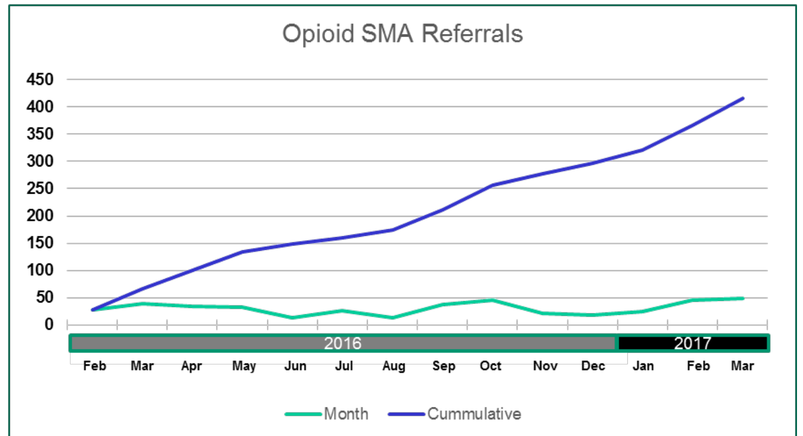
The content for Shared Medical Appointments (SMAs) was initially developed by our consultant, Dr. William Brose. Content is divided into three modules: (1) Opioids: The Good, The Bad, and the Ugly; (2) The Neurobiology of Pain; and (3) The Experience of Pain. The first model was presented at 90 minute CME accredited “Simulated” SMAs to PAMF healthcare providers who attended Boot Camps and who were interested in the content and/or were potentially interested in leading a patient-facing SMA. A total of 5 Simulated SMAs were held (**Table 3**). Content was rapid-cycle improved based on attendee feedback. Nineteen PAMF providers attended. In addition, Dr. Bronstein delivered content from the first module at a “mock” SMA, which was attended by two patient advisors.

Table 3. Simulated/Mock SMA Overview		
Division	**Date**	**Number of Participants**
Camino	October 27th, 2015	2
Camino	November 10th, 2015	4
Palo Alto	October 15th, 2015	4
Palo Alto	October 19th, 2015	7
Santa Cruz	December 3rd, 2015	2
Palo Alto (mock SMA)	December 7th, 2015	2 (patient advisors)
	TOTAL	21

On the basis of the healthcare provider and patient feedback, the content of this first module was finalized in Late December 2015. We identified 3 primary-care physicians who will lead patient-facing SMAs; these individuals are highly engaged and invested in improving CP management in the system. These providers have access to Dr. Brose’s online training environment where they can view and practice the material for all modules. The first patient-facing SMA is being pilot tested in the Santa Cruz Division of PAMF. This is a logical pilot site, as there is already infrastructure in place for pain-related SMAs. Patient-facing SMAs began in February 2016. We have developed take-home materials for patients who attend the SMAs, with information and resources about non-pharmacological therapies and safe drug disposal

SMA #1 (Opioids: The Good, The Bad, and the Ugly) was initiated in February 2016. Referrals to the SMA have remained steady (20-50 referrals per month), with 436 patients attending the program over a year (between February 2016 and March 2017) (**Figure 7**).

Figure 7. SMA Referrals



An evaluation of the patient-reported experiences immediately before and after the SMA revealed rapid improvements in patient ratings of confidence in self-managing pain and healthcare providers ability to help manage pain (**Figure 8**). The majority of participants were satisfied with the SMA, although fewer reported likely behavioral change (**Figure 9**). These findings have been published. The full published manuscript has been provided as additional material submitted with the final report.

Figure 8. Pre-Post SMA Outcomes

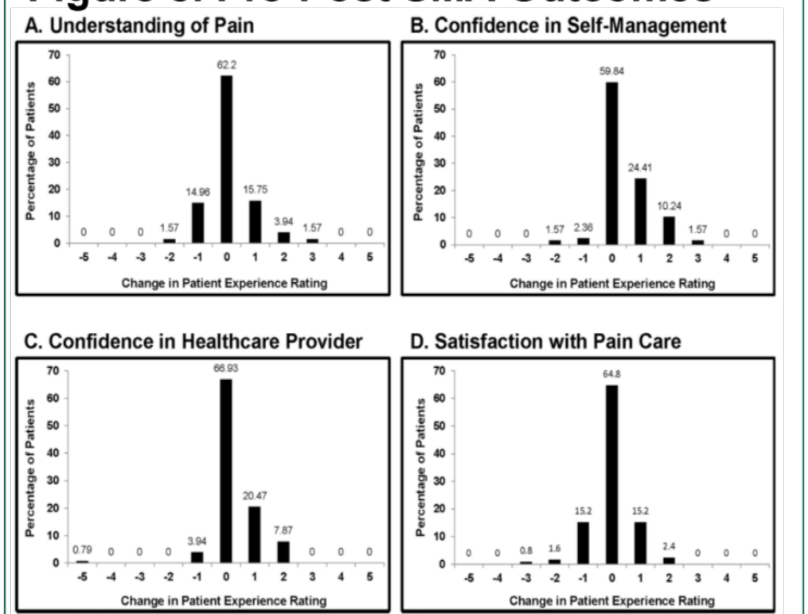
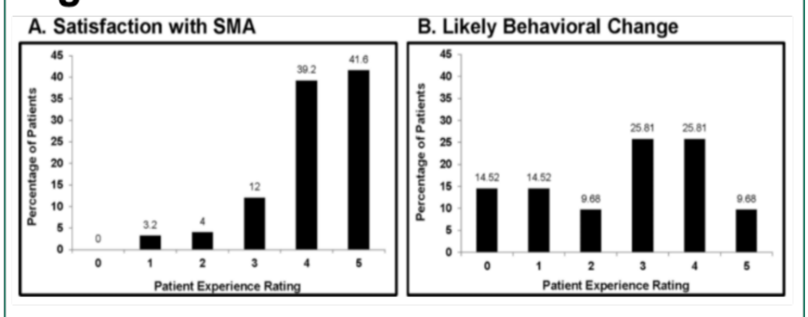


Figure 9. Post SMA Outcomes



Challenges:

- Resistance from physicians in wanting to facilitate SMAs
- Identification of resources (e.g., facilitators) to extend use of SMAs in other PAMF divisions and throughout Sutter Health has been difficult
- Difficult to alert physicians to the benefits of the SMA in helping them manage patients with pain (informed consent)

Opportunities:

- Strong infrastructure for SMAs in Santa Cruz could help to expand SMAs
- Positive preliminary findings of patient-experience at SMAs will give support to continued use and expansion of SMAs to help patients in understanding and managing chronic pain
- Make SMA content available to physicians so that they know more about what they are referring to and how the SMA can help them manage patients.

3e. PAIN DEPARTMENT

Over the last 12 months, the CPMR Program has gained much attention from PAMF leadership, who recently approved the development of a Pain Department. To this end, a pilot department is being created by bringing Dr. Brose (local expert) on-site on a part-time basis in the Camino Division. Dr. Brose is scheduled to start work ½-day a week on August 10th. He will see patients on chronic opioids, especially high-risk patients. Referrals will come from primary-care physicians and some specialists. The pilot department will serve to determine necessary infrastructure and workflow, and to assess patient disposition and outcomes. This will ensure the success of a fully-implemented Pain Department by identifying the necessary services that PAMF needs to develop. Once demand for services is known, this service will be opened up to the other divisions.

Challenges:

- Volumes of patients are expected to exceed availability of our pain consultant before our infrastructure is in place to expand service hours
- Some providers in divisions other than Camino are dissatisfied with the roll-out process
- Providers do not understand the nature of the service, believing that it is a receptacle for the complete transfer of care of patients for all pain-related care
- Ability to dispose patients to appropriate resources will be restricted by insurance coverage of some modalities (e.g. acupuncture, chiro, yoga) and especially by lack of behavioral health resources
- On-boarding process for this first provider in the team (other providers from Dr. Brose's group are expected to also provide services) is burdensome and slow due to bureaucratic requirements, for example, credentialing enrollment, build of providers into the EHR

Opportunities:

- This pilot allows us to assess what the needs of the PAMF patient population will be in a granular fashion
- Feed back to providers allows case-by-case real time learning between pain management expert and the referring physician
- PAMF physicians will have the opportunity to put learnings into practice in a timely manner as they care for other chronic pain patients
- The project makes visible the extent of need by our providers and patients, meaning we can make the business case for adding services such as physician extenders (NP, pain psych, PharmD) as adjunct in the program

4. DISCUSSION

In this CPMR, we successfully educated physicians on evidence-based practices in opioid prescribing for CP management and provided them with customized EHR tools to document and better manage their CP patients in order to maintain state and federal guidelines. Furthermore, we were successful in developing and deploying a SMA on the benefits and risks of opioids. Overall, this project raised awareness for the need for the better management of CP within a healthcare system, leading to a pilot test for a pain management department. Despite the successes of the program, we faced numerous limitations, which served as important learning opportunities. Learnings include the following: (1) at both the individual and organizational levels, resistance to change is significant; (2) there is no one-size-fits-all approach to managing chronic pain or changing the culture around the management of chronic pain; and (3) in this regard, a "lean" methodology using rapid cycle improvement is appropriate.