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**Project Title: Improving Pain Management at Hospital Admission and Discharge:
Implementing an Interdisciplinary Evidence-Based Approach**

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Purpose

Overall aim is to improve the acute and chronic pain management of hospitalized patients with chronic, non-cancer illnesses, both while they are in the hospital and post discharge. The intent is to identify pain management strategies and build an infrastructure that will facilitate broader scale dissemination.

The two objectives include:

1. To demonstrate the effectiveness of pain management strategies in two hospitals
2. To disseminate a toolkit to assist hospitals in improving pain management

Scope of Project

Pain is a major public health problem affecting more American adults than heart disease, cancer, and diabetes combined. Over 116 million U.S. adults suffer from chronic pain, and federal expenditures for pain care total \$99 billion a year. Management of pain costs up to \$635 billion each year in medical treatment and lost productivity.¹ The negative physiological, psychological, and social consequences of pain are well documented. A number of advances have occurred in recent decades to improve the quality of pain management. Pain education is required in training and continuing education of health care professionals. Specialties have been created in pain management and palliative care. Institutions have created comprehensive programs to provide expert pain management throughout the care continuum. The Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) accreditation program includes national standards on assessment and management pain in all settings where patients are cared for.

Despite these advances, a number of gaps remain in the quality and safety of pain management provided to patients. Hospitalized patients continue to experience moderate to severe pain. Over reliance on opioid based therapies has led to significant adverse events and a nationwide epidemic of opioid misuse and diversion.³⁻⁶

As frontline physicians in hospitals and leaders of quality improvement programs, hospitalists find themselves in the cross-hairs of these national problems of inadequately pain treatment and opioid misuse. Though pain management is a core competency for hospitalist physicians, many hospitalists find themselves under-trained to safely and adequately treat pain. Furthermore many hospitals and medical centers lack robust and coordinated pain care systems that optimize both opioids stewardship and patient outcomes.

The goal of this project was to convene an expert panel comprised of a multidisciplinary national expert panel of hospitalists, pharmacists, nurses, and quality leaders. The panel developed an implementation guide entitled “*Improving Pain Management for Hospitalized Medical Patients*” that provides a systematic approach of implementing a QI program of improving pain management for medical patients through best practices. The focus is on medical patients, though many of the principles described in the guide are relevant to patients

recovering from surgical care who are increasingly co-managed by hospitalists. The quality improvement practices are drawn from the faculty experts' experience as well as previous work in other fields including previous Society of Hospital Medicine implementation guides.

The approach of this project was based on a model developed by the Society of Hospital Medicine (SHM). The Joint Commission and the National Quality Foundation awarded SHM the prestigious Eisenberg Award in April 2012 for its *Resource Room/Mentored Implementation model*. Over the past eight years, this model has been successfully applied to address other critical clinical quality improvement challenges.

The four basic principles of the Resource Room/Mentored Implementation model are:

1. Identify and disseminate actionable best practices—not just the “what” of the guideline(s) but the “how” to launch and sustain the initiative
2. Share effective, field-tested implementation strategies, identify common pitfalls and roadblocks, and recommend tactics to overcome these issues
3. Devise practical measurement strategies to assess baseline performance /track progress
4. Foster leadership skills in QI in the targeted clinical champion—the hospitalist—and his/her affiliated QI teams

This project was executed in a two phased approach:

PHASE 1: PILOT STUDY

Demonstrate (at two hospitals- University of California San Francisco and University of California-Irvine) effective interventions for managing patients with pain. The interventions focused on transitions into the hospital (admission) and out of the hospital (discharge). The goal was to incorporate these interventions into the process flow and systems of the two hospitals, so they become part of the fabric of care delivery, impacting patients in a real-time fashion and producing consistent/reliable performance improvement.

Methods:

Study Design: Quality improvement project with pre-post evaluation

Data Sources/Collection: Chart review, patient reports from the electronic medical record, project tracking sheets, patient interviews and HCHAPS surveys

Interventions:

Design and Implementation of Pain Management Protocols: The improvement teams formulated a best practice protocol to guide patient pain management. The protocol addressed address: 1) pain assessment and documentation; 2) opioid dosing at initiation; 3) opioid titration advice; 4) use of a Patient Controlled Analgesia (PCA) pump; 5) ancillary methods for pain control; 6) appropriate use of a bowel regimen; and 7) when and how to refer to the inpatient pain specialists. This guidance was reinforced in regular educational sessions, and integrated into care workflows. A screening algorithm was implemented at daily

interdisciplinary rounds to identify patients with uncontrolled or inadequately controlled pain. These interventions allowed the interdisciplinary teams to manage opioids more effectively.

Proactive monitoring: Teams at each center proactively monitored pain management and adherence to the protocol through daily reports that identify patients that have not reached acceptable pain ratings, and triage them for further intervention.

Prescription Drug Monitoring Program: To address the issue of communication regarding opioid prescribing amongst multiple physicians and multiple pharmacies, many states have implemented prescription monitoring programs (PDMPs). For optimal pain management, hospitalists need to know what opioids the patients they are admitting has taken, particularly for patients with recurrent evaluations in the ED or inpatient setting, patients with a history of abuse, and patients with multiple stated allergies that limit the opioid choices. We created workflows to ensure that teams had access to PCMP reports for patients admitted to the medicine service.

Daily Interdisciplinary Rounds: We incorporated pain assessment and management into daily interdisciplinary rounds. These rounds occur every weekday morning and include the hospitalists, the unit charge nurse, the case manager/discharge planner, and the social worker. At these rounds, the goals for pain relief were discussed for each patient as part of their discharge dashboard. Pain was consider uncontrolled at 24 and 48 hours after admission if the patient's pain severity score is above a 4 out of 10 or reduced by less than 50% from admission pain severity. Inadequately controlled pain will trigger a mandatory intervention. The interdisciplinary team was recommended to choose one of the follow options for patients with uncontrolled pain:

- Pain consultation from the acute pain service or palliative care
- Pharmacist consult
- Change the patients pain regimen
- Non-pharmacological therapies (e.g. music, massage, relaxation)

Hospitalist Trainings: We provided education about pain management, including opioids dosing, PDMP use, non-pharmacologic interventions, inpatient and outpatient specialty pain care, and communication at regularly scheduled meetings and educational sessions, as well as on-line and in a just in time fashion, related to specific patients.

Measures: We measured our objective to improve pain management by using a pre/post design to test the effect of the intervention on the percent of patients receiving relief. The percent of patients with pain score of 6 on the first hospital day are in the denominator. The patients achieving 50% improvement in pain or pain score < 4 by hospital day 3 are the patients in the numerator for our primary outcome of interest. Other outcomes include 7-day emergency department visits, and 7-day and 30-day readmission rates. To accomplish this, we identified a cohort of 200 patients with proactive monitoring from the study hospitals (100 patients per site) with length of stay >= 3-4 days, AND a documented pain score of 6 or more with 24 hours of admission. We compared these outcomes in the baseline period to a cohort of

200 patients identified from each of the study hospitals in the last months of implementation of the intervention. Pain satisfaction scores were tracked on a quarterly basis for the two hospitals before and after the intervention implementation begins.

Patient satisfaction scores are collected as part of routine operations of the medical centers in HCAHPS surveys. The percent of patients that are satisfied with pain management at a level of 5 on a scale of 1 to 5 is summarized for each unit, and each hospital.

We also performed needs assessments with patients and staff about the perceptions of pain needs.

Limitations: We were not able to include functional assessments due to limited recording of these in the medical record. For HCHAPS scores, the “n” of patients fluctuates with the percentage of patients responding to the voluntary survey, making *accurate a priori* calculations of statistical power difficult. Furthermore, this data cannot be tracked to individual patients who might be selected for interventions in this project. Instead, data are reported by specific units.

Results:

Principal Findings: Before compared to after the project, we did not observe a significant change in the pain scores, hospital length of stay, 7-day post-discharge ER visits, or 30-day hospital readmissions. Patients indicated that their satisfaction with pain management could be improved by improved communication with hospital staff and care coordination.

Outcomes:

At UCSF, we did observe trends toward a higher percentage of patients with improved pain by hospital day 3 and discharge, and a lower frequency of re-presentation to the ER within 7 days, though these differences did not reach statistical significance by chi square test.

UCSF			
	Pre-intervention (May-June 2013) n=108	Post-intervention (May-June 2014) n=89	p-value pre-post (chi-square test)
Patients with improvement at least a 50% improvement in their highest pain score by hospital day 3, n (%)	4 (4%)	9 (10%)	0.09

Patients with improvement at least a 50% improvement in their highest pain score by discharge, n (%)	46 (47%) ^a	42 (55%) ^b	0.4
Hospital length of stay, median days, (range)	5 (2-220)	5 (2-36)	n/a
Patients who presented to the ER within 7 days of discharge, n (%)	11 (10%)	5 (6%)	0.3
Patients who were readmitted to the hospital within 7 days of discharge, n (%)	7 (6%)	5 (6%)	n/a
Patients who were readmitted to the hospital within 30 days of discharge, n (%)	23 (21%)	18 (20%)	n/a
^a of 97 patients with a pain score in the 24 hrs before discharge			
^b of 77 patients with a pain score in the 24 hrs before discharge			

Similar to UCSF, at UCI (see table below) we observed no change in the major outcomes of this project for its interventions. The sole exception is a small increase in the number of pain consultations. This increase was mostly due to the implementation of a pain pharmacists consult option.

UCI		
	Pre-intervention n=100	Post-intervention n=100
At least a 50% improvement in highest pain score by hospital day 3	22	10
At least a 50% improvement in highest pain score by discharge	72	70
Hospital length of stay, median days	6.7	6
Presentation to ER within 7 days of	3	9

discharge		
Readmit within 7 days of discharge	5	1
Presentation to ER within 30 days of discharge	25	30
Readmit within 30 days of discharge	27	27
PCA ordered	16	12
Non-opioid therapy	25	23
Pain consult	2	16

We also followed HCHAPS scores at both institutions for the two items relating to pain management before and during the project period, for patients on the hospital medicine service on our two target units (the main hospital medical units). Despite our efforts, we have not been able to achieve an increase in the percentage of patients who are reporting that their pain was always controlled or that the staff did everything to control their pain. Scores are shown in the tables below:

UCSF

Quarter	7/1/2013-9/30/2013	10/1/2013-12/31/2013	1/1/2014-3/31/2014	4/1/2014-6/30/2014
Pain well controlled, % "Always"	62%	61%	61%	63%
Staff do everything help with pain, % "Always"	81%	78%	80%	80%

UCI				
Quarter	7/1/2013-9/30/2013	10/1/2013-12/31/2013	1/1/2014-3/31/2014	4/1/2014-6/30/2014
Overall Pain Management, % "Always"	67%	63%	64%	70%
Pain well controlled, % "Always"	58%	60%	60%	65%

Staff do everything help with pain, % “Always”	75%	67%	68%	75%

To better understand how we can meet the needs of patients on the medical service, we conducted interviews with patients at UCSF who were having pain and reviewed comments in HCHAPS survey responses. Identified themes were: Optimal medications including getting the right type, dose, and dosing frequency; concerns re: side effects/addiction; Timely treatment including waiting for MD evaluation, MD orders, response to call lights; Asking and listening including checking in, validating, stating concern, collaborating with patient on plan, responsiveness to patient needs; and Care coordination including among hospital clinicians, with outpatient MDs, problems with scripts at discharge. These themes are being fed back to clinicians caring for patients on the medical units to improve our responsiveness to their pain, and incorporated into ongoing efforts on our service and medical center to improve responsiveness to pain.

Discussion: It may be that a higher number of patients evaluated would show significant changes. The high percentage of patients without a 50% improvement in their pain is a main finding of our project, and is indicative of the high percentage of patients with chronic pain. It may be difficult for interventions to improve the pain score for these patients, which is why we began to focus our project on patient satisfaction.

Conclusions: An intervention focused on primarily on medical management of chronic pain did not produce significant improvements in pain scores. Patients identified communication and care coordination as key targets for efforts to improve satisfaction with pain management.

Significance: These results were used to guide the development of the implementation guide, which can be used by other hospitals to improve pain management.

Implications: Hospitals should focus on medical management of pain, but nonpharmacological treatments and communication are also very important targets, especially for patients with chronic non-cancer pain.

PHASE 2: IMPLEMENTATION GUIDE

We convened a panel of 8 national experts from multiple disciplines and specialties, including pain management, palliative care, primary care, hospital medicine, nursing, addiction medicine, and psychology. An implementation guide was developed based on pilot experience at the 2 project sites, and also the panel's experience and relevant resources and literature. This guide is finalized and available for download on the SHM website at www.hospitalmedicine.org/painmanagement.

The guide focuses on utilizing the electronic medical record to alert physicians when patients are in pain, selection of appropriate metrics to feed back to physicians, automating feed back of metrics, collaboration with ongoing efforts at the medical center, the importance of staff to support pain management processes, e.g. pharmacists and clinical nurse specialists who are dedicated to pain management, and the importance of nonpharmacological intervention availability in the hospital setting. We are continuing our efforts to improve pain management for our medical patients at UCSF, in collaboration with the UCSF medical center pain committee and the Division of Hospital Medicine.

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