

PRIMARY CARE & HEALTH SERVICES SECTION

Original Research Article

Redesigning Delivery of Opioids to Optimize Pain Management, Improve Outcomes, and Contain Costs

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Conflict of Interest/Disclosure: Dr. Turk has received
grant support and/or consulting fees from Eli Lilly,
Endo, Feering, Galderma, OrthoMcNeil-Janssen,
Pfizer, Philips Respiroics, the National Institutes of
Health, and the United States Food and Drug
Administration.

Abstract

Introduction. Chronic pain is a public health concern, and in the last decade, there has been a dramatic increase in the use and abuse of prescription opioids for chronic non-cancer pain.

Methods. We present an overview of a five-component model of pain management implemented at the University of Washington Division of Pain Medicine designed to facilitate recent state guidelines to reduce the risks associated with long-term use of prescription opioids.

Results. Central to the model described are guidelines for best clinical practice, a collaborative care approach, telehealth solutions, comprehensive prescription-monitoring, and measurement-based care.

Discussion. The model presented is a patient-centered, efficient, and cost-effective approach to the management of chronic pain.

Key Words. Coordinated Care; Telehealth; Care Models; Pain Management; Patient Assessment, Accountable Care

Introduction

Chronic pain is an urgent public health concern significantly impairing the physical, psychological, and social functioning of those experiencing it and their significant others [1,2]. The Institute of Medicine recently estimated that more than 116 million adults, over one-third of the population, in the United States experience some form of chronic pain [2], with symptoms of pain being the most common reason people consult a physician [3]. The National Center for Health Statistics noted that 40% of people reporting chronic pain indicate that pain causes moderate-to-severe degradation in their functioning [4], resulting in excessive costs not only to individuals but society. Specifically, it is estimated that chronic pain costs between \$565 and \$635 billion per year in health care and reduced productivity, and these costs have increased five-fold in the past decade and will likely increase with the aging population [2]. These costs do not reflect the incalculable impact of pain on the lives of patients and their significant others.

In response to the growing crisis of chronic pain [2], there has been a considerable increase in the frequency of prescribing opioid medications over the past decade [5,6]. In 2008, it was estimated that during any given week, over 10 million Americans were taking prescribed opioids with 4.3 million taking them on a regular basis [7]. One unintended consequence of increased prescribing has been the concomitant increase in the prescription misuse and dependence along with nonmedical use of these drugs. In 2007, 12.5 million Americans used prescription pain analgesics for nonmedical purposes [8]. Further, more than 14,500 people die annually from opioid overdoses resulting from medical and nonmedical use, exceeding the causes of death from automobile accidents in 15 states [9]. Although this problem is a national crisis, certain regions have been affected more than others. Specifically, in the State of Washington, the rate of opioid-related deaths doubled between 2004 and 2007, half of the deaths occurring in the Medicaid population [10], significantly higher than the national rate [11]. Furthermore, the costs of opioids were estimated at \$55.7 billion, which includes expenses related to work, health care, and criminal justice expenditures (due mostly to inconsistent prescribing, patient misuse and/or abuse, and “doctor-shopping,” a phenomenon in which patients attempt to obtain multiple prescriptions from multiple providers) [12,13].

The Washington State Response

In 2007, the Washington State Agency Medical Directors' Group (AMDG), representing all Washington State public payors, published its first opioid dosing guideline after review of the epidemiologic data, scientific literature, and consultation with many practicing physicians and professional associations. The guideline was updated in 2010 and expanded its resources for primary care providers (PCPs) treating adult patients with chronic non-cancer pain. The AMDG Opioid Dosing Guidelines [14] provide evidence-based recommendations for PCPs to prescribe opioids in a safe and effective manner. This includes initiating or transitioning opioid therapy, assessing or monitoring chronic opioid therapy through outcomes assessment and prescription monitoring, and tapering or discontinuing opioids. These guidelines include a "yellow flag" warning dose that recommends that prescribers seek a consultation from a pain management specialist if their patient's combined opioid dosage has increased to 120-mg morphine equivalent dose (MED) or more per day without a substantial improvement in function and pain based on validated patient-reported outcome tools [14]. This was the first time any state established a dosing recommendation [15]. Ultimately, these guidelines serve to educate health care providers on safe and effective treatment for the chronic pain patient receiving long-term opioid therapy.

The implementation of these guidelines in Washington State was effective in curtailing opioid-related abuse and death. Within the Washington State workers' compensation system, there has been a significant decline of 27% in the MED per day of long-acting Drug Enforcement Administration Schedule II opioids, a 35% decrease in the proportion of workers on opioid doses >120 mg/day MED, and a 50% decrease in the number of opioid-related deaths from 2009 to 2010 [15]. Although the introduction of these guidelines is associated with a decline in opioid-related morbidity and mortality, other concurrent steps are recommended, such as more intensive education programs for both providers and patients, the use of prescription-monitoring programs, and the use of evidence-based practices [15].

In 2010, the Washington State Legislature passed Engrossed Substitute House Bill 2876 (ESHB 2876) to address the public health emergency of opioid-related abuse and death, and to significantly improve the quality and safety of pain management for people with chronic non-cancer pain. Based on the AMDG Dosing Guidelines, the bill directed the Washington State Department of Health to adopt rules to standardize care for chronic non-cancer pain patients by specifying, for physicians: "dosing criteria, including a dosage amount that may not be exceeded without consultation with a pain management specialist; guidance on when to seek specialty consultation and ways in which electronic specialty consultations may be sought; guidance on tracking clinical progress by using assessment tools focusing on patient interference, physical function, and overall risk for poor outcome; and guidance on tracking the use of opioids" (ESHB 2876).

In an attempt to address the prevalence, costs, mortality, and impairments associated with the long-term prescription of opioids used to manage chronic pain, the University of Washington (UW) Division of Pain Medicine (DPM) developed an integrated, multicomponent approach. This model was developed based on the chronic disease model of care pioneered by Engel [16] and was adapted to meet the specific needs of pain patients. The overarching goal was to create a comprehensive program for safe and effective opioid management that implements the mandates of ESHB 2876 and AMDG dosing guidelines in practice, which in turn will lead to improved patient care. In this article, we outline the components of this model that will each serve as testable pieces to enable us to later assess the utility of this model in reducing patient risk of opioid misuse and abuse.

UW Model of Pain Management

The UW Model of Pain Management (Figure 1) follows from the standard of pain care as specified by the AMDG Guidelines and ESHB 2876 by using multiple, interacting components to create a system of *coordinated care* between PCPs, pain specialists, and nurse care coordinators. These components include: 1) using a *stepped-care* approach to pain management within a *collaborative care* framework that empowers patients to "own" their pain and participate actively in their pain management; 2) *telehealth* solutions to improve access to specialty care services; 3) *prescription-monitoring services* to improve patient safety and alert providers about specific patient care issues; and 4) implementing tools for the *measurement* of pain, mood, and function in every clinical encounter. Our intended benefits include a reduction of risk for opioid misuse and abuse through a continuity of care between primary and specialty care settings, more timely access to pain specialists, and enhanced monitoring of patient risk for opioid misuse problems, as well as patient outcomes across different levels of health care delivery. Each component of the model is described in greater detail later.

Collaborative Care

Underlying the UW Model of Pain Management is a *collaborative care* approach to the management of chronic pain. In traditional care, physicians and pain specialists are considered the "experts" for treating patients' health condition, while patients are afforded little autonomy to make decisions regarding the direction of their care. When managing chronic pain conditions both with and without the use of opioids, however, a paradigm shift is required that emphasizes a triad of care between the health care patient, PCP, and pain specialist with support from a nurse care manager [17,18]. This form of collaborative care affords the patient the ability to participate in the decision process for their pain management. Patients set goals utilizing the provider's and pain specialist's recommendations, which encourages them to make informed choices. With the further support of the nurse care manager, all

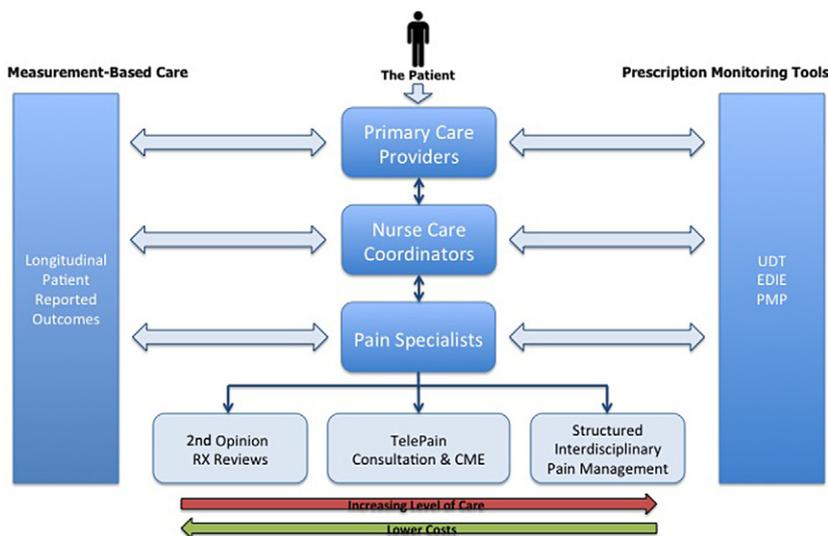


Figure 1 The University of Washington model of pain management. CME = continuing medical education; EDIE = Emergency Department Information Exchange; PMP = prescription monitoring program; RX = prescription; UDT = urine drug testing.

parties identify problems and work in concert to overcome obstacles using problem-solving skills developed through this team framework [17].

Stepped-Care

One approach used to implement this type of collaborative care model in practice is labeled “stepped-care” [19]. When following a stepped-care management strategy, patients proceed through three consecutive steps, and treatment is guided by the patient’s responses to each preceding step [20]. In the first step, all patients seeking care from their PCP for pain are assessed, and the PCP assists them with identifying specific concerns they may have about their pain. Standard, first-line interventions are implemented when appropriate, and measures are taken to determine and enhance the patient’s readiness for self-managed care. Patients that continue to experience pain several weeks following their initial visit with their PCP about their pain will proceed to the second step, where a specifically tailored treatment program is developed. If necessary, a consultation with a psychologist is sought, and the PCP and psychologist determine if a comprehensive program for pain management is necessary. Finally, patients that continue to experience significant emotional distress and functional limitations that the psychologist and PCP cannot address will proceed to the third step, where an interdisciplinary team of providers become extensively involved in their care [20].

Multiple randomized, controlled trials using a stepped-care approach within a collaborative care framework have been conducted and demonstrated the effectiveness of this form of treatment on patient outcomes while demonstrating the cost-effectiveness of this approach in comparison with “usual” care. For example, successful interventions have been designed to address major depression or dysthymia [21], depression with comorbid musculoskeletal pain [22] diabetes mellitus with comorbid depression [23], as well as chronic pain [20,24]. More

specifically, the Improving Mood: Promoting Access to Collaborative Care program in Washington State determined that patients receiving collaborative care for 12 months evidenced more depression-free days at a 24-month follow-up [21], greater reported quality of life, higher physical functioning, decreased burden from pain, and reduced health care utilization at 4-year follow-up [25]. The stepped-care approach has also recently been endorsed as policy for pain management by both the US Army Office of the Surgeon General and the Department of Veterans Affairs [26,27].

Telemedicine and TelePain

The collaborative care approach to pain management can effectively enhance the quality of care and facilitate successful communication between patients and their PCP, and specialty care providers. Unfortunately, millions of individuals in the United States with chronic health conditions have limited access to appropriate levels of care whether that is due to a lack of insurance or living in a rural or underserved area [28]. Thus, although practice guidelines specify when specialty care should be sought, in underserved areas, it may be difficult or impossible for patients to receive the care they require. Recognizing this need, the University of New Mexico Health Sciences Center developed a Project Extension for Community Health Care Outcomes (ECHO) telemedicine program to provide individuals in underserved areas specialty treatment for chronic diseases [29,30]. Initially, Project ECHO was developed to treat the growing problem of hepatitis C but has now been successfully expanded to treat a variety of conditions including diabetes, human immunodeficiency virus/acquired immunodeficiency syndrome, substance abuse disorders, mental illness, and chronic pain.

In collaboration with Project ECHO, the UW DPM has implemented a regional telemedicine model for chronic pain through our *TelePain* initiative covering five states (Washington, Wyoming, Alaska, Montana, and Idaho).

Web-based videoconferencing allows PCPs to consult an interdisciplinary team of UW specialists trained in pain medicine, behavioral health, and substance abuse through “disease-specific learning networks” on a twice-weekly basis to review and discuss each case, and to present didactic information of a topic listed in the International Association for the Study of Pain curriculum regarding appropriate pain patient management more broadly (where participating providers can earn continuing education credits at no cost). Thus, a collaborative relationship is formed between the PCP and UW pain specialist that we intend will provide the PCP with additional skills necessary to treat their difficult chronic pain patients and more effectively manage their risk for opioid misuse.

We anticipate that participation in the TelePain program will foster learning for the providers, much like Project ECHO [29,30]. As in Project ECHO, PCPs are provided with specific information to treat complex and difficult cases, but the knowledge gained by these learning networks goes beyond the specific case being discussed: clinicians can apply the content area information taught in each session to similar cases. These networks further enable the community-based practitioners to learn from each other decreasing the isolation that can be experienced when practicing in a rural area [30], as they are able to interact with each other in real time. Furthermore, both ECHO and TelePain reduce patients’ need to travel great distances to receive specialty care.

Comprehensive Prescription Opioid Management

In following the recommendations set forth by ESHB 2876 and AMDG opioid dosing guidelines, the UW DPM recognized that a system must be in place that provides practical tools for assessing risk factors, monitoring outcomes, and ensuring safe opioid-prescribing practices and attainment in order to reduce the risks associated with opioid use for chronic pain management. Based on the AMDG Guidelines, four tools for prescription opioid management have been incorporated into the UW Model to meet this need and includes: 1) second-opinion clinics, 2) an Emergency Department Information Exchange (EDIE), 3) comprehensive urine drug testing (UDT), and 4) measurement-based care.

Second-Opinion Clinics

Prescription practices can vary widely from provider to provider, and to improve the safety of these practices, it may be necessary to obtain a second opinion for the appropriateness of the prescription, as well as the type of drug or dosage being prescribed. In 2004, a state-based initiative was implemented through Washington State Medicaid to monitor the combination use of attention deficit hyperactivity disorder (ADHD) medications and high-dose prescriptions for the treatment of ADHD in children and adolescents. Safety thresholds were established, and any prescriptions that exceeded these thresholds were subjected to a second-opinion review [31]. The second-opinion program effectively reduced

dosing above recommended standards, reduced the number of individuals undergoing combination ADHD therapies, and resulted in cost savings exceeding \$1.19 million in psychostimulant prescription costs [32].

In collaboration with the Washington Department of Social and Health Services, the UW DPM has developed the clinical model for second-opinion reviews for opioid doses currently prescribed in the state’s Medicaid population. The second-opinion clinic was designed to address abuse and misuse of prescriptions by: 1) re-educating prescribers, 2) requiring prior authorization of multiple scripts, 3) utilizing a preferred drug list that encourages equally effective generics, and 4) requiring a mandatory second opinion for high-dose patients and prescribers.

EDIE

The safety of chronic pain patients can be enhanced when their obtaining of prescriptions is monitored. With more than half of all visits for primary care occurring with a doctor other than the patient’s personal physician and 28% occurring in emergency departments (EDs), a system that alerts providers to visits and prescriptions obtained from multiple providers is necessary [32]. Pioneered in hospitals within the cities of Spokane and Olympia, Washington, the EDIE program provides a prescription-monitoring tool that reduces the chance of patients obtaining multiple prescriptions from multiple providers. The EDIE program is a networked service that provides access to information about a patient’s previous visits to the ED and prescriptions that have been obtained in other EDIE participating facilities. For patients denied an unscheduled prescription refill request at the ED, EDIE facilitates a notification to the patient’s PCP, if the patient has one.

After EDIE was implemented in Spokane and Olympia, Washington, claims for pain patients that were frequent users of the ED, mostly for pain-related reports, were analyzed for the 120 days before and after enrollment in the ED care coordination program [33]. Overall expenditures for all health care (e.g., EDIE, ED, and pharmacy costs) decreased by 37% or \$2,328 per patient. The number of ED visits decreased by 53% in the first 4 months after enrollment. These findings are supported by other US and Canadian studies [34]. Based on this success to date, the UW DPM has obtained approval from UW Hospital Administration to implement EDIE system-wide within the EDs of hospitals under the purview of UW Medicine, and we hope to demonstrate savings of a similar magnitude when EDIE is realized at UW hospitals.

Comprehensive UDT

Monitoring patients’ adherence to prescribed opioids is critical for chronic opioid therapy in order to identify if a patient is adhering to their treatment plan and identify possible drug misuse or abuse [35]. UDT is an objective method used to meet this need and has been found to be a more effective tool compared with behavioral monitoring

alone in managing patients on chronic opioid therapy [36]. Thus, the AMDG guidelines [14] mandate the use of UDT monitoring and offer detailed risk-based schedules for their clinical application. In accordance with the AMDG Guidelines, the UW DPM has developed a UDT protocol that we anticipate will keep testing burden to a minimum, including: 1) point of care (POC) testing at every patient visit; 2) full laboratory testing at program baseline, and 3) as-necessary full laboratory testing when patients' POC testing indicates a "red flag" for nonprescribed substances or unapproved levels of current prescription opioids.

Measurement-Based Care

Although the UW Model of Pain Management incorporates a number of tools intended to reduce the risks associated with long-term opioid use, the fragmented nature of health care can make it difficult to achieve this goal. This problem makes it necessary that a system be in place that can assist health care experts with accurately and effectively tracking patients, as well as one that can be used to assess the quality of the programs provided. Many health experts and policymakers are making it clear that health information technologies (HITs), such as electronic health records and electronic tracking systems, are fundamental to meeting these needs [37]. Although the utilization of HIT has demonstrable benefits [38], the use of this form of technology in hospitals and by physicians remains low [39]. To expedite the implementation of such technologies, Congress signed into law the Health Information Technology for Economic and Clinical Health Act, which provides incentive payments to hospitals who adopt and use HIT systems [40].

Systematic reviews of the benefits of HIT underscore the usefulness of such systems [41,42], including improved quality of health care by increasing adherence to guidelines, decreasing medication errors, enhancing monitoring activities, and decreasing unnecessary utilization of care. Furthermore, the benefits of comprehensive HIT solutions do not differ by the type or size of the institution, demonstrating that benefits resultant from HIT services are not limited to large, multisite institutions and could likewise be implemented in smaller settings (e.g., hospitals and facilities in rural areas) [36].

Systematic Assessment and Monitoring

Seeing the benefits of utilizing an electronic health system, the UW DPM has adopted an electronic *measurement-based model* for the management of opioid use and chronic pain management. Utilizing a patient assessment and screening tool that consists of validated measures, we intend to streamline care between PCPs and pain specialists. This tool provides the backbone of assessment for all of the UW Center for Pain Relief patients. A Web-based, intuitive interface provides patients with the opportunity to describe how pain impacts key domains of their quality of life, such as pain interference, pain intensity, functional status, and emotional health, as well as inform clinicians of their patient's level of risk for opioid abuse.

This model of measurement-based care can inform clinicians of important patient characteristics, treatment progress, and the overall quality of care provided using summary reports generated prior to the patient's visit.

We are now in the process of phased implementation of our pain assessment model within the broader UW Medicine clinics that also treat a sizeable population of patients with chronic pain conditions (e.g., chronic fatigue clinic, sleep medicine, family medicine, orthopedics). The data acquired will be aggregated within a pain registry and used to evaluate the clinical effectiveness and cost-effectiveness of various treatments, determine the characteristics of patients who are most likely to benefit from the treatments available (responder analyses), be used by hospital administrators to determine how best to focus limited resources, and be used by payers to establish the most cost-effective treatments to guide their decisions regarding reimbursement [43].

As described earlier, the implementation of the AMDG guidelines has been associated with reduced opioid-related morbidity and mortality, but to be optimally effective, guidelines should be paired with provider education as well as measurement-based feedback that providers can use in their daily practice. Thus, one underlying goal of our longitudinal patient-reported outcomes system is to provide up-to-date feedback to clinicians on a relevant set of outcome measures to help them understand the complexity of their chronic pain patients as the first step toward improving opioid monitoring and health care for this population.

Conclusion

The substantial increase in the frequency of prescribing opioid medications, and dramatic rise in mortality, morbidity, misuse, and abuse of opioid medications seen over the last decade are a symptom of the lack of effective opioid management and delivery of chronic pain care in our country. We argue that an integrated, collaborative, and measurement-based approach to opioid management is needed for optimizing care for individuals with pain. Our guiding principles are: 1) promoting efficient, clinically effective, and cost-effective quality of care, not quantity of services; 2) helping patients regain control of their lives; 3) enhancing the value and impact of pain care guidelines and protocols; 4) expanding knowledge through research, development, and testing of models of health care delivery; and 5) disseminating knowledge by presentations and local, national, and international meetings and publications. The UW Model of Pain Management puts these guiding principles into practice through a collaborative pain program that is patient-centered, measurement-based, and value-oriented, utilizing state-of-the-art tools to optimize patient care and cost containment. A central ingredient underlying the entire model is continuous evaluation and refinement. By emphasizing accountable care, with the operative word being "count," we will use data acquired in a continuing effort of improvement of quality, balance of resources, and cost.

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