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Pain Education at the University of Washington School of Medicine

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Abstract

Contemporary medical education is inadequate to prepare medical students to competently assess and design care plans for patients with acute and chronic pain. The time devoted to pain education in most medical school curricula is brief and not integrated into case-based clinical experiences, and it is frequently nonexistent during clinical clerkships. Medical student pain curricula have been proposed for over 30 years and are commonly agreed upon, though rarely implemented. As a consequence of poor undergraduate pain education, postgraduate trainees and practicing physicians struggle with both competency and practice satisfaction; their patients are similarly dissatisfied. At the University of Washington School of Medicine, a committee of multidisciplinary pain experts has, between 2009 and 2011, successfully introduced a 4-year integrated pain curriculum that increases required pain education teaching time from 6 to 25 hours, and clinical elective pain courses from 177 to 318 hours. It is expected that increased didactic and case-based multidisciplinary clinical training will increase knowledge and competency in biopsychosocial measurement-based pain narrative and risk assessment, improve understanding of persistent pain as a chronic complex condition, and expand the role of patient-centered interprofessional treatment for medical students, residents, and fellows, leading to better prepared practicing physicians.

Keywords

Pain education; medical school curriculum; University of Washington

There is little disagreement among pain physicians and primary care educators that chronic pain as a complex patient experience is not adequately taught in U.S., and British medical schools.^{5,8,12,14,18,32} This problem exists despite recommended curricula for all health care professionals first published over 30 years ago.²⁵ Recently proposed enriched medical student pain curricula are often limited to a short interval, concentrated intersession or web-based content.^{22,29,36} Mezei and Murinson²¹ reported an extensive survey of all pain content taught in U.S. medical schools and found a median of just 7 sessions with a range of 1 to 28 and found that only 4% of medical schools have integrated pain material within case-based

clinical teaching settings. The British Pain Society in 2009 and Briggs et al⁷ have reported 13 hours of median pain curriculum in UK medical school curricula. Watt-Watson et al,³⁴ in a study for the Canadian Pain Society, reported 16 hours throughout Canada. Mezei and Murinson also documented “significant gaps” between specifically recommended pain curriculum and actual educational content in North American medical schools in a survey of Association of American Medical Colleges between 2009 and 2010, identifying a mean of 9 and median of 7 hours of pain education.²¹ Of 104 medical schools evaluated, only 4 (3.8%) reported a required pain course and 17 (16.3%) offered electives. They concluded, “There are inarguable links between the undertreatment and the maltreatment of pain and the lackluster state of pain education in medicine.” Watt-Watson et al³³ had previously reported the average veterinarian pain curriculum to be 87 hours, prompting Macleans, a leading popular Canadian publication, to satirically announce on its cover, “Your dog can get better health care than you.”²⁸ The recently published transformational report of the U.S. Institute of Medicine (IOM) about relieving pain in America²³ confirms the self-report of inadequate pain competence of both actively teaching academics and community-practicing physicians,^{20,32} as well as the medical students themselves.^{4,10,35} The IOM identified the chief problems in medical school education to be “a lack of breadth in the presentation of the topic, a lack of integration of basic science and clinical knowledge, and a lack of clinical role models—especially specialists treating chronic pain—in most academic medical centers.”²³ An urgent training need exists to understand pain as a chronic disease to prevent ever more patients and medical practices from becoming disabled by the challenges of chronic pain.

Introduction of new curriculum content into university-based medical schools is always difficult. It is a challenge to teach encompassing information within a very compressed time frame, with the demand to prepare all types of future physicians for competency of practice in a wide array of specialties. The structure of medical curriculum decision-making engenders longtime interdepartmental disagreements over the value of basic sciences as well as one medical disease or disease area over another.¹ The failure to recognize the prevalence of pain patients in most primary care practices has led to an imbalance of topics within the curricula of most schools of medicine. When pain is included in a medical school curriculum, there are significant debates about how and when it should be taught.¹⁸ Finding time for pain education in an already fully loaded medical school curriculum of fixed length and hours usually means that some other content must be dropped, to the dismay of its proponents.

An additional complication is that many medical schools, the University of Washington among these, disperse students throughout a wide geographic area to broaden their training experiences and to encourage medical graduates to return to their originating communities. This process requires a portable curriculum, especially during geographically remote rotations. There are potential solutions to this geographic dispersal in widely available and still emerging telemedicine technology like the recently reported Project ECHO at the University of New Mexico,² but medical students have not yet been routinely instructed on their roles and how to gain access to this innovative form of expert consultation.³ Finally, and most importantly, very few American medical schools provide the needed collaborative interspecialty care model so essential for effective pain treatment.³³ In the real world, physicians need to know how to work with other health care professionals to successfully manage chronic pain patients, as was first identified and implemented by John Bonica over 50 years ago.⁶

Methods

In response to these problems, in the fall of 2009, the University of Washington School of Medicine (UWSOM) curriculum oversight committee approved a “Pain Theme Committee” composed of multispecialty educators and clinicians (Anesthesia, Internal Medicine, Neurological Surgery, Psychology, Pediatric Psychology) to review existing UWSOM pain content, to identify gaps requiring new material, and to propose how a more fully integrated pain medicine educational program could be introduced throughout the 4-year curriculum for our students. We conducted an intranet web-based survey of medical students at the UWSOM to demonstrate how effectively we were preparing our graduates for the management of chronic pain patients. Just 21% of UWSOM students felt they received an adequate didactic and only 15% an adequate clinical education in pain medicine, 77% reported “too little,” and only 22% reported “just right” overall level of pain education. One student commented in free text that he had “learned” after 4 years of medical school when confronting a patient with pain “to run.” Clearly our students recognized their educational deficiencies.

The processes we utilized followed those of the University of New Mexico’s cross-cutting themes approach.¹⁶ The goal was to best match students’ learning level with the relevant preclinical and clinical experience during their progress over 4 years. To avoid “hidden curriculum” bias and the myths about pain and pain patients often communicated by faculty and trainees in the course of the students’ clinical rotations,¹⁵ explicit content was introduced into 3rd and 4th year required clinical clerkships. Introduction of a robust telemedicine pain multidisciplinary consultation allowed access to identical curriculum in a “just-in-time” clinical clerkship didactic and case-based format. The telemedicine platform of provider-to-provider problem-based team learning during UW TelePain sessions follows the principles of adult learning: active engagement of the student in an actually occurring problem-solving exercise makes the lesson more comprehensible and learning more durable, or “stickier.”²⁷ With this program, students and their faculty now present problem cases to a panel of experts for online, immediate recommendations for management. In addition, selected clinically relevant didactic content is presented to a widely disseminated group of listeners. Prior to the time of the initiation of this project in March 2009, the UWSOM required pain curriculum consisted of 3 hours of “Concepts of Pain” in an introductory Systems of Human Behavior course, and 2 hours of opioid and anti-inflammatory pharmacology and 1 hour of addiction pharmacology. Two elective preceptorships were available, both with sparse student enrollment. Another 1-hour elective focused on inpatient opioid ordering was optional just prior to medical school graduation.

The Pain Theme Committee decided that to improve medical student competency in pain diagnosis and treatment, it was necessary to implement much of the International Association for the Study of Pain (IASP)-recommended 1988 medical student curriculum²⁵ and selected content from the IASP specialty core update of 2005 with a focus on patient narrative, co-occurring biopsychosocial conditions and risks, common office-based primary care chronic pain conditions, and opioid, nonopioid, and nondrug treatments, with less attention to pain pathways, research design, and surgical and neuromodulatory interventions⁹ (Table 1).

The committee made this decision based in part on the experience of its chair (D.J.T.), who for 27 years prior had practiced concurrent primary care internal medicine and pain medicine and had directly observed the challenges confronting primary care physicians in his own practice group, which included 23 primary care internists, and the problems of many other similarly trained physicians attempting to manage chronic pain in a large urban practice setting (Seattle, WA). Other members of the committee (including D.J.T. and

J.D.L.) also served as medical experts to statewide practice advisory committees, and similarly observed the need to stress biopsychosocial approaches and reduce reliance on opioids and interventional procedures in the care of common pain disorders seen in outpatient primary care practices.^{11,13,17,18,32} The IASP recommendations were abbreviated since it would take 74 hours to cover all aspects at an advanced level of proficiency, well beyond the scope and depth needed for the medical student.²⁶ We focused upon new advances in pain medicine in primary care and addressing the increasing complications of opioid monotherapy and overuse throughout the U.S. and our region.

We also introduced a structured multidimensional measurement-based care approach to the student's evaluation of complex pain patients with the intention to assess effect on demonstrated student performance of the Accreditation Council for Graduate Medical Education-related competencies. These measures will be made using pre- and post-course assessments of clinical knowledge, demonstration of systems- and evidence-based practice, patient-centered care, communication, quality improvement, practice-based learning, professionalism, and use of informatics as well as students' completed course evaluations and self-reported perceived competency, and summarized ratings of instruction provided by the UW Office of Educational Assessment to the course instructors. Reframing the student approach to evaluation and treatment of chronic pain with routine measurement of function, mood, and risk, we expect students will more readily formulate patient-centered assessments and evidence-based treatment plans.

In addition, the University of Washington provides publicly supported medical education through its 40-year partnership between the UWSOM and the states of Washington, Wyoming, Alaska, Montana, and Idaho to meet physician workforce needs in rural and under-served areas for this 5-state region. Geographically dispersed students at over 50 educational sites require a portable curriculum, with consistent goals, objectives and content. Using an existing telemedicine platform (Project ECHO/UWTelePain) allowed 3rd year Family Medicine students to consult directly with an interspecialty faculty of pain experts, following a problem-based learning approach.^{2,31} Elective "just-in-time" access to multidisciplinary pain consultations is soon to be expanded to include all 3rd and 4th year required clerkships (internal medicine, surgery, pediatrics, psychiatry, neurology, and emergency medicine), linking to an online introduction and instruction on role, value, access, and presentation requirements to enable student case presentations using this innovative format.

Results

We have effected an increase from 6 hours of required pain specific course content to 25 hours at the UWSOM. Table 2 presents the currently implemented curriculum. In addition, elective pain education course opportunities have increased by 80%, from 177 to 320 hours. In the past academic year (2010–2011), 6 students have completed an additional 416 hours of elective pain training (see Table 2).

Discussion

Why is medical student pain education important? Because future doctors will perform best when provided the proper training to provide treatment for their patients with pain. This focus article reports on the response by the UWSOM to concerns similar to the subsequently published IOM's Report on Pain Care in America.²³ The status quo of pain education and pain treatment outcomes in U.S. medical schools and elsewhere has been demonstrated to be unsatisfactory.^{5,8,11–13,15,17,25,34} Scant pain-focused didactic course work, rare and haphazard clinical content hours (especially as it pertains to chronic pain disorders), and

very few if any shared interprofessional pain courses, promotes persistence of inconsistent, nonevidence-based, and noncollaborative pain treatment in the practicing community. Expected consequences of incomplete pain education include limited training about alternatives to opioid monotherapy; incomplete knowledge and skills in pain diagnosis and treatment risk assessment and management; insufficient demonstration of coordinated care with physical rehabilitation, nursing, social services, addiction medicine, and pharmacy; and inadequate modeling of the skills needed to effectively implement appropriate behavioral counseling. Annual U.S. expenditures on chronic pain are now in excess of \$600 billion, exceeding per annum costs of cancer, heart disease, or diabetes²³; and despite this enormous payout, worsening annual increases continue to be reported in treatment complications, scheduled drug diversion, and accidental overdoses and deaths.²⁴

How Can Improved Medical Student Pain Education Help?

Frustrations with poor outcomes prompt negative student and physician attitudes of their patients struggling with chronic pain, which further reinforces overall poor outcomes of pain treatment. Medical student dissatisfaction with pain education has been reported among students intending to pursue a primary care specialty.¹⁰ The short survey we report in this article shows that this dissatisfaction extends to all University of Washington medical students. There is evidence that increased time educating medical students results in improved knowledge and attitudes.²² Students completing their 4-week Pain Track clerkship have told us during informal exit interviews, “I can’t believe I almost didn’t learn this”; and insightfully repairing their own biases, “I didn’t know pain patients were so nice.” As Scott Fishman¹² has said so well: “The problem is simply that most doctors aren’t well prepared to manage pain. And who enjoys doing something that they aren’t trained to do?” Whether increased medical student pain education alone is sufficient to improve patient and population outcomes will remain to be seen, but the curricular changes described in this focus article need to be introduced to initiate the educational process.

Curriculum Renewal

Revising medical school curriculum is a challenging venture. The 100-year anniversary of the Flexner model for U.S. medical education has been the time to review objective deficiencies and make curricula “more sticky.”²⁷ The UW, like several other major U.S. medical schools, has initiated such a curriculum renewal process.³⁰ Overall, UW curriculum renewal aims at introducing clinical contact at every educational level, fostering reflective and interactive case-based learning, reaching students taught in geographically dispersed settings, and increasing emphasis on interprofessional education. All of these goals are addressed and largely well met in this reported pain curriculum now implemented in the UWSOM.

Which Curriculum

The UWSOM Pain Theme Committee did deliberate as to which version of published pain education would be determined most relevant. In this instance the active clinical faculty unanimously agreed the IASP content would be focused primarily on clinical practice needs, and on common and challenging multidimensional chronic pain disorders that account for the majority of primary care pain treatment encounters.¹⁹ Especially important is web-based learning platforms, covering both didactic content and clinical case-based vignettes and telemedicine to provide a uniform content across multiple remote training sites where significant didactic and clinical rotations occur over all 4 years.

The Right Time to Promote Pain Education Innovation

At the UWSOM it was an opportune time to make these changes by adding a Chronic Pain Track to an existing chronic care clerkship covering palliative care, rehabilitation medicine, and geriatrics. A concurrent course-by-course review of the UWSOM total pain curricular content identified the need to extend existing biobehavioral lectures; to add pain interviewing skills to introduction to clinical medicine content; to include emerging mind and pain theory (such as central sensitization); to add clinical pain cases to existing pharmacology courses; and to enable medical students and other health specialty trainees to directly participate in a multistate regional telemedicine case-based didactic and multidisciplinary pain consultation service. Community preceptors strongly support student participation and expect that they will be benefited themselves by what is now a student-initiated remote site clinic activity.

Next Steps

Following implementation of the UWSOM's newly expanded and fully integrated 4-year pain curriculum, we will be prepared to demonstrate improved undergraduate medical student self-perceived efficacy and increased clinical competency using objective structured clinical examinations and other evaluation methods. We expect that the medical student increases in pain education will carry over to house staff and attending physicians who are participating in these activities as well. We hope that the substantial increase at the UWSOM in undergraduate pain education will improve the ability of future graduating physicians to provide more competent pain diagnosis and treatment. Since this is a long overdue first step, we also plan to increase the quality of instruction and relevance to the patient and community seeking to obtain skillful care for such problems as acute and chronic pain. Of course, we recognize the need to continuously demonstrate to the University's curriculum oversight committee members, departmental chairs, and administrators that the increased time spent educating students about pain increases the quality and scope of their undergraduate medical education and will lead to improved academic and community health care outcomes.

Conclusions

There is a compelling need for implementation of new approaches to pain medicine education in both medical and other health science schools in response to the increasing evidence of inadequate and insufficient pain medicine education both in the U.S. and elsewhere. The UWSOM has recently increased pain curriculum time spent and the future practice relevance of its pain education by implementing a 4-year integrated curriculum tailored to match both the learning level and clinical experience, including most of the IASP's recommended content, while emphasizing the educational needs of future primary care physicians, those who are and will continue to manage the vast majority of patients seeking medical advice and treatment of both acute and chronic pain.

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Perspective

Strategies for improving multidisciplinary pain education at the University of Washington School of Medicine are described and the preliminary results demonstrated.

Table 1**UWSOM Pre-Graduation 4-Year Pain Curriculum Content Outline**

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- 1** Biopsychosocial pain pathology and multidisciplinary model of care
 - a. Empowering the provider
 - b. . Empowering the patient
 - 2** Measurement tools/outcome evaluation and use in clinical decision- making
 - a. Taking the pain history
 - b. Functional assessment
 - c. Risk assessment
 - d. Practice self-assessment
 - 3** Common primary care disorders
 - a. Fibromyalgia
 - b. Spinal pain (neck and back pain)
 - c. Neuropathic pain
 - d. Headache
 - e. Visceral pain
 - f. Osteoarthritis
 - 4** Drugs and procedures
 - a. Overview of pain pharmacology
 - b. Rational opioid prescribing
 - i. Special emphasis on long-acting agents
 - ii. Weaning opioids
 - iii. Ethics of pain relief
 - iv. Epidemiology
 - c. Nonopioid pain medications
 - d. Common interventional procedures
 - 5** Nondrug integrated pain management
 - a. Behavioral health
 - b. Physical therapy and rehabilitation
 - c. Vocational rehabilitation
 - d. Acupuncture and other Complementary Medicine pain treatments
 - 6** Drug misuse and abuse
 - a. Addiction
 - b. Diversion
 - c. Use of agreements
 - d. Urine drug testing
 - 7** Pain care in specific populations
 - a. Pediatric
 - b. Older persons
 - c. Pregnancy/child-bearing age
 - d. Comorbid psychiatric and addiction disorders
 - e. Pain management in resource scarce environments, ie: rural and urban underserved
 - f. Acute on chronic (inpatient and outpatient)

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Table 2

Current UWSOM Pain Education Curriculum

Required courses		
Year 1	Systems of Human Behavior: Concepts of Pain: 3 hours	Physician and Psychologist lecture and interactively engage students with invited pain patients
Year 2	Pharmacology: 5 hours	Principles of Pain, Case-based Clinical Pharmacology, Opioids, NSAIDs, Addiction management
	Introduction to Clinical Medicine: 2 hours	Facilitated content expert Skills Session focusing on Pain Interview and Opioid Medication Prescribing Skills. Pain interview didactic followed by small group case-based workshop using measurement-based evaluation and tools, special Rx issues, consenting, managing aberrancy.
Year 3	Family Medicine Clinical Clerkship: 5 hours	Active student participation in TelePain extended network community outreach telemedicine interspecialty pain medicine case consultation
Year 4	Chronic Care Clinical Clerkship: 2 hours	Pain case-based learning format overview and Opioid Q&A didactics first and last day of 4- week rotation. Additional 8-hour pain resources course web-content
	Chronic Care Clinical Clerkship: 144 hours, selected by lottery	10% of Chronic Care students participate fulltime outpatient interspecialty clerkship at UW Center for Pain Relief: includes 5 days at Seattle Children's Hospital for in- and out- patient pediatric pain care and a 4-hour Acupuncture observership in collaboration with accredited complementary medicine program at Bastyr University
Elective courses		
Years 1–2	Preceptorship in Interspecialty Pain Clinic: 32 hours	For 1st –2nd year students Independent Investigative Inquiry ("Triple I") Variable hours. Student selected and independently investigated topic of particular interest (pain related) utilizing the advice of a faculty advisor
Year 3	Required Clerkships (Family Medicine, Internal Medicine, Surgery, Pediatrics, Psychiatry, Neurology, and Emergency Medicine): Variable hours.	Access to TelePain problem-based case presentation, discussion and treatment planning during students' other clinical rotations
Year 4	Anesthesia/Pain Medicine: hospital based: 144 hours	Focus on specialty care of acute and interventional pain treatment, directed towards students interested in anesthesia, surgical specialties, and primary care.
	4th year Capstone session: 1 hour	Inpatient ordering of opioids (PCA)

Abbreviations: NSAIDS, nonsteroidal anti-inflammatory drugs; PCAs, patient-controlled analgesia.