Innovations in Pain

Advances in care delivery, research, and education offer better opportunities for non-opioid pain management.

EXPERIENCING PAIN IS A NORMAL PART OF LIFE. Pain is a danger signal, a warning that we are hurt, that something is wrong. We all have personal experiences with painful injuries or conditions that quickly resolve after healing or following brief medical or surgical care. But when pain persists, as it does for at least 116 million U.S. adults and more than 20 million children, pain becomes a disease in its own right, leading to relentless suffering that all too often destroys individual lives and families.

When pain care becomes overly reliant on opioids, as it has over the past 15 years, the flood of opioids spills over and impacts whole communities. In Washington state, opioid prescribing increased 500 percent between 1997 and 2006.¹ Last year, 18,000 Americans died of accidental prescription opioid overdoses.² Opioid overdose deaths now exceed auto accident fatalities in more than 30 states.³ Chronic pain in adult Americans costs at least $650 billion annually in treatment and lost productivity.⁴ But the full human impact cannot be quantified. Patients—especially those at high risk for addiction—need effective alternatives to dangerous opioid painkillers. Transformational changes in pain management are happening now, and innovations originating in Seattle are leading the way.

The legacy of pain medicine in Seattle

In 1960, Dr. John Bonica joined the University of Washington as its first chair of Anesthesiology. He founded the specialty of Pain Medicine and soon after introduced the world’s first multidisciplinary pain clinic. Bonica introduced techniques of regional anesthesia to the management of acute and chronic pain. He also was the first to recognize that pain can and does often persist, even after tissue disease or damage has healed, and that pain can occur even in the absence of evident physical injury.

In the 1970s, the UW Multidisciplinary Pain Center became the leading international center for pain care, research, and education, training over two generations of the world’s pain experts. Bonica’s 1953 book, The Management of Pain, now pending its fifth edition, laid out the first principles for the treatment of pain as a symptom of disease or injury, and for when pain itself had become the disease.

Multimodal brain retraining

Increasing evidence supports an expanding range of psychological and physical interventions that reframe and retrain the patient’s pain experience. Routine in-parallel (rather than in-series) addition of many proven nondrug treatments expands the scope of strategies proven to effectively improve physical function and mood, and restore purpose, meaningfulness and enjoyment of life for people struggling with chronic pain. While these have long been fundamentals of multidisciplinary pain care, they are also frequently undervalued, overlooked, and often unavailable.

Recent neuroscience research using functional MR imaging demonstrates brain re-mapping and notable recovery of diminished neuronal volumes that occurs in patients with successfully treated chronic pain.⁵ Still not yet fully understood, glial cells, generally dismissed as inert structural scaffolding of the central nervous system, are now seen to be anatomically and physiologically transformed in the process described as “central sensitization.” Gial cells appear to sensitize the central nervous system, regulating synaptic plasticity of the excitatory and inhibitory pain circuits in the spinal cord, leading to enhanced pain states.⁶ Glial cells have been demonstrated to activate in response to a wide variety of both physical and behavioral stress, such as injury, sleep deprivation, PTSD, and following exposure to opioids. Central sensitization is now considered a common syndromic diagnosis, co-occurring in many common overlapping pain disorders, such as fibromyalgia, chronic headaches, functional bowel, and interstitial cystitis.⁷ Recovery of brain structure and function occurs when patients receive and practice cognitive-behavioral therapies and related varieties of relaxation therapies, such as biofeedback and mindfulness-based

stress-reduction training. The commonly prescribed drug, pregabalinal (a non-opioid anticonvulsant) has been shown to restore “connectomes” (interaction maps of the many widely dispersed brain areas involved in the pain experience). Physical and occupational therapies, including graded motor imagery (including mirror therapy), reduce kinesiophobia (fear of movement), that interferes with functional recovery. Other integrative medicine approaches, complementary and alternative medicine techniques, such as traditional acupuncture as well as dry needling and trigger point injections, are becoming established acute and chronic pain treatments.

Multidimensional pain assessment
Since chronic pain is a complex biopsychosocial disorder, evaluation and treatment requires a systematic multidimensional approach to assessment and strategically targeted interdisciplinary therapies. Expanding beyond the “0–10/10” pain intensity, the “fifth vital sign,” pain evaluation and treatment must also require measurement of physical function, mood, quality of life, and treatment risk. Comprehensive pain assessment identifies the psychosocial difficulties that when defined can specify interprofessional domains of treatment needed: physical or occupational therapy when physical function is poor, psychological interventions when mood is anxious, depressed, or when PTSD is present. Tracking these same parameters over time and measuring response to these prescribed care pathways improves patient outcomes and satisfaction and reduces costs with targeted therapies. First recommended here in Washington with publication of state agency guidelines in 2007 (updated in July 2015), is a Health Care Authority-approved guideline and a national model, endorsed by the Centers for Disease Control. Accountable Care Organizations notably all require reportable outcomes, and so require accountable measures.

Internet-based patient-reported outcomes
Here in Seattle at the University of Washington, and also at Stanford University and the Department of Defense, internet-based multidimensional assessment and tracking tools have been introduced in primary and specialty practices. At the University of Washington, we have developed, deployed and are now studying our web-based patient-reported outcomes and a tracking tool called PainTracker. Using PainTracker, individualized and targeted pain-care plans have demonstrated significantly improved outpatient treatment

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outcomes, and we expect inpatient outcomes and costs of care to similarly improve.

Pain education for providers and patients

Pain is so poorly represented a topic in American medical schools (the mean curriculum is a paltry eight hours over four years, despite the fact that 70 percent of visits include pain as a patient concern, and 30 percent of patients in primary care clinics report chronic pain) that physicians themselves report pain-related distress from “flying blind.”13 Web-based interactive pain education for inter-professional pain-care providers has been recently funded by the NIH Centers of Excellence in Pain Education, of which the University of Washington is an awardee. Training modules are soon to be posted online by NIH and will be freely available for educators.

UW TelePain™, a provider-provider live and interactive televideo education, was introduced in response to the Washington State Department of Health’s 2011 regulatory requirements necessitating access to pain specialty consultation for patients who meet one or more of these criteria: on high-dose opioids, have poor pain outcomes, or are at high risk of addiction. Following decades of long-distance medical education and remote consultation throughout Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI), these programs have delivered over 6,000 hours of chronic pain training, education, and consultation.14

Pain is ultimately best managed by patients who are well informed as to the cause or causes of their pain, who have expectations of outcomes that are realistic, and who have treatment plans in which they are actively engaged. When patient attitudes, beliefs, and expectations about pain and opioids are identified early in the course of treatment planning, better primary and surgical pain care decision-making follows. Web-based patient-facing interactive pain education programs piloted at the Seattle VA are now in active development by the UW Pain Division. Patient-led Chronic Pain Self-Management Programs developed by Kate Lorig from Stanford University will soon be available at Harborview Medical Center, and patient pain outcomes will be evaluated in a collaborative UW-Stanford pilot study.

The national pain strategy

One requirement of the Affordable Care Act was to develop a “national pain strategy.” With public comment on the plan recently concluded, stay tuned for a strategy to improve professional education and training, public health, population research, and public education and training in pain.15 Among other goals, the strategy intends to introduce and support core competencies and pain education portals for all stages of education, licensure, and certification; to integrate and coordinate evidence-based strategies for prevention and treatment; and to promote pain self-management following a biopsychosocial approach.

Innovations in pain, ready to go

Clinical management structured according to optimized care pathways can precisely match and deliver individualized and scientifically selected pain treatment pathways that are implemented, tracked, and evaluated for impact over a broad range of evidence-based pain outcomes. Multidimensional diagnosis can improve quality of pain care by expanding the scope and depth of coordination among inter-professional health service provider teams.

When pain is better understood by providers and patients, and then assessed and treated according to the multidisciplinary principals first introduced by John Bonica 55 years ago, we will be able to relieve pain more effectively. We now have the knowledge, tools, and the will. So, let’s get going!

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