New Directions in the Treatment of Chronic Pain

National Pain Strategy Will Guide Prevention, Management, and Research

Susan L. Worley

More than four years after the release of a landmark report by the Institute of Medicine (IOM) on pain in America, there are encouraging signs that the U.S. may be poised to undergo the "cultural transformation" advocated by the report.

The IOM's 2011 publication, *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research*,[1] succeeded in bringing attention to the long-underappreciated problem of pain. The report has also served as an often-cited source of facts that continue to startle new readers—including the estimate that, in 2011, approximately 100 million U.S. adults suffered from pain at a cost of approximately $560 billion to $635 billion a year.[1] The publication acknowledged that an underfunding of research was a significant barrier to progress, with only about 1% of a National Institutes of Health (NIH) budget that exceeded $30 billion devoted to the study of pain; however, it envisioned a comprehensive solution to the problem that went far beyond the development of new treatments. Relabeling pain a "biopsychosocial" phenomenon, the report urged a new recognition of its complex, multidimensional nature, as well as the wide range of individual variations in susceptibility to pain, cultural and emotional interpretations of pain, and responses to treatment.

Sean Mackey, MD, PhD

One eagerly awaited legacy of the IOM report is the soon-to-be-released final draft of the National Pain Strategy (NPS),[2] which the NIH has described as a comprehensive population health–level strategy for pain prevention, treatment, management, and research. It contains recommendations for coordinating the efforts of government agencies and public–private partnerships to improve pain assessment and management programs throughout the country.

"The goal of the National Pain Strategy is to provide patient-centered, interdisciplinary care that is compassionate, well informed, and individualized to every patient who is experiencing pain," says Sean Mackey, MD, PhD, Chief of the Division of Pain Medicine at Stanford University, who served as co-chair of the Oversight Committee of the NPS as well as co-chair of its Prevention and Care working group. The immediate past president of the American Academy of Pain Medicine (AAPM), Dr. Mackey was also on the 19-member committee that wrote the 2011 IOM report. He has described the NPS as a tactical document in contrast to the IOM blueprint.

"The implementation of the National Pain Strategy will lead to tangible benefits to people suffering from pain," says Dr. Mackey. "It won't happen overnight, but this strategy will point us in a proper direction moving forward. It will help to ensure, among other things, that we better educate the physicians, psychologists, and physical therapists who are caring for people with pain so that they are better prepared to help manage these complex conditions. Ultimately it will lead toward providing people who are suffering from pain the wide range of services that already exist but that currently are not readily available to everyone."

Many of the services available today can be found at the Stanford Pain Management Center, which has been recognized as a Center of Excellence by the American Pain Society and is a model for approaching pain treatment from a biopsychosocial perspective. At the center, interdisciplinary teams of specialists design tailored treatment plans for patients with acute or chronic pain to address multiple problems that contribute to pain and interfere with functioning.

In partnership with the NIH, and in response to objectives outlined in the IOM report and the NPS, researchers at the Stanford Systems Neuroscience and Pain Laboratory (SNAPL) have established the Collaborative Health Outcomes Information Registry (CHOIR), an open-source platform that will be used to collect much-needed outcomes data on large numbers of patients suffering from chronic pain. Researchers at the lab also are examining emotional and cognitive factors that influence pain, as well as neuroplastic changes that occur in response to chronic pain, with a focus on the use of neuroimaging[3] to investigate normal pain processing, pain disorders, and treatment options. Among current projects are studies using functional magnetic resonance imaging (fMRI) to examine how real-time feedback might be used to improve control over pain, and transcranial magnetic stimulation (TMS) to determine how various brain regions impact pain processing. Several studies are devoted to identifying factors that lead to chronic pain after injury or surgery, with the goal of developing interventions to prevent the transition to chronic pain.

"One of our primary interests right now is in the development of brain-based biomarkers," Dr. Mackey says. "Biomarkers hold a great deal of promise in helping us to better understand how to distinguish pain from not-pain. Perhaps just as important, they are an integral part of the developing field of neuroprognosis—a field that eventually will allow us to predict whether an individual is more likely to respond to one treatment compared with another."

Researchers at Dr. Mackey's lab also are examining novel pharmacological approaches[4] to the treatment of pain, which may help to provide patients and clinicians with alternatives to treatment with opioids.

"It's important to examine the problem of opioids as part of a comprehensive public health issue, and to recognize that there isn't going to be a single solution," Dr. Mackey says. "We need to take a multiple-level approach to this problem—to focus, for example, on better educating our physicians in medical school and beyond about the appropriate use of opioids, and about

Susan Worley is a freelance medical writer who resides in Pennsylvania.

Table 1 Selected Current Nonopioid Treatments for Chronic Pain*

Drug (Brand Name, *Manufacturer*)	FDA-Approved Indication(s)	Comments
Carbamazepine (Tegretol, *Novartis*)	Trigeminal neuralgia, epilepsy	Often used off label for other chronic pain conditions
Duloxetine (Cymbalta, *Eli Lilly*)	Diabetic peripheral neuropathic pain, fibromyalgia, chronic musculoskeletal pain, major depression, generalized anxiety disorder	
Gabapentin (Neurontin, *Pfizer*)	Post-herpetic neuralgia, epilepsy	Often used off label for other chronic pain conditions
Lamotrigine (Lamictal, *GlaxoSmithKline*)	Epilepsy	May be used off label for trigeminal neuralgia and other neuropathic pain conditions
Pregabalin (Lyrica, *Pfizer*)	Post-herpetic neuralgia, neuropathic pain associated with diabetic peripheral neuropathy, spinal cord injury pain, fibromyalgia, epilepsy	Often used off label for other chronic pain conditions
Tizanidine (Zanaflex, *Acorda Therapeutics*)	Spasticity	Often used off label for neuropathic pain conditions, chronic headache, and other conditions
Tricyclic antidepressants (e.g., amitriptyline, nortriptyline, doxepin)	Depression, anxiety, and some other psychiatric conditions	Often used off label for multiple types of chronic pain conditions
Ziconotide (Prialt, *Jazz Pharmaceuticals*)	Management of severe chronic pain in patients for whom intrathecal therapy is warranted	Recommended reading: "Practical Considerations and Patient Selection for Intrathecal Drug Delivery in the Management of Chronic Pain" (Saulino et al., *J Pain Res* 2014;7:627–638).

* May be used off label

Source: Charles E. Argoff, MD. For more information, see "Pharmacotherapy for Neuropathic Pain in Adults: a Systematic Review and Meta-Analysis" (Finnerup et al., *Lancet Neurol* 2015;14:162–173); "American College of Rheumatology 2012 Recommendations for the Use of Nonpharmacologic and Pharmacologic Therapies in Osteoarthritis of the Hand, Hip, and Knee" (Hochberg et al., *Arthritis Care Res [Hoboken]* 2012;64:465–474); and "Medications for Acute and Chronic Low Back Pain: a Review of the Evidence for an American Pain Society/American College of Physicians Clinical Practice Guideline (Chou et al., *Ann Intern Med* 2007;147:505–514).

how to better recognize those individuals who are vulnerable. It's also important to educate our patients. The solution is not going to be simply developing new treatments. In fact, we already have a lot of nonopioid treatments available now; however, many physicians are not yet educated about how to use them appropriately." A list of some currently approved nonopioid treatments for pain appears in Table 1.

The Pain Epidemic Versus the Opioid Crisis

While the U.S. pursues new approaches to the treatment of pain, problems associated with the use of opioid analgesics persist and have led to considerable divisiveness in this country. Recent editorials on this topic have described antagonism between two principal groups—a cautious majority of experts, well aware of the drawbacks of opioids but intent on taking a measured approach to the problem, and a minority who seem intent on sharply curtailing the use of these drugs despite potentially disastrous consequences. Discord between these groups grew more pronounced after the September 2015 release of draft guidelines for prescribing opioids by the Centers for Disease Control and Prevention (CDC).[5]

Lynn Webster, MD

A widely perceived opioid crisis, which has been traced to well-documented increases in the use of opioids since the 1990s, recent increases in opioid-related deaths, and ongoing concerns about the diversion of these drugs,[6] prompted the development of the guidelines. Their intent, according to the CDC, is to guide clinicians who receive insufficient training in prescribing these drugs. However, since their release, some experts have expressed a long list of concerns, ranging from the potential legal implications of the guidelines to their potential harm to patients. The American Cancer Society[7] and a growing number of other prominent organizations also have publicly declared that they cannot endorse restrictions proposed by the CDC.

Lynn Webster, MD, Vice President of Scientific Affairs at PRA Health Sciences, a recent past president of the AAPM and a leading expert on the treatment of chronic pain and the use of opioids, says he is troubled by the CDC's draft guidelines. The inventor of a renowned opioid risk tool[8] (a short, self-administered patient survey now used by thousands of physicians to help identify individuals vulnerable to the misuse of opioids), he is acutely aware of the risks posed by opioids but maintains that abruptly curtailing their use is not a responsible or humane solution.

"Some of the recommendations in the draft document are quite strong and were made with a lack of supporting evidence," Dr. Webster says. "The recommendation, for example, that prescriptions not exceed the equivalent of 90 mg of morphine is unsupportable. There is no evidence that patients cannot be safely placed on more than this amount of the drug. Furthermore, there are millions of Americans who are currently taking this drug for much-needed pain relief."

The author of *The Painful Truth* (2015), a new book that docu-

ments personal and physical struggles of individuals suffering from pain, Dr. Webster says that he receives calls or emails at least weekly from patients in chronic pain who are panicked because their doctors are suddenly refusing to continue their long-time treatment with opioids. With the constant stream of negative and unbalanced information about opioids in the media, he adds, doctors have become increasingly afraid even to treat people in pain.

"I think the consequences of these guidelines are potentially serious, without any foundational evidence for the recommendations they contain," he says, echoing the concerns of a significant number of his U.S. colleagues. Moreover, Dr. Webster notes that important recommendations are missing from the guidelines. "Nowhere in the CDC guidelines are clinicians encouraged to use abuse-deterrent formulations of opioids, which very clearly have been demonstrated to reduce the potential harm to patients."

Since 2014, the Food and Drug Administration (FDA) has approved several abuse-deterrent (AD) formulations of opioids, and more than 33 states have proposed legislation to require the inclusion of such AD products on formularies. The development of novel formulations and routes of administration that address not only the potential for abuse but also the analgesic tolerance (diminished pain relief), hyperalgesia (increased sensitivity to pain), and other problematic side effects associated with opioids is the focus of a great deal of current research (Table 2).[9,10] Dr. Webster and colleagues at PRA Health Sciences are actively involved in some of these efforts, as well as research aimed at the development of new nonopioid compounds.

"We are about 60 years behind cancer research when it comes to developing new treatments for pain," Dr. Webster says. "Sixty years ago, cancer researchers were beginning to look at novel small molecules that could be used to effect remissions or cures, and there have been wonderful successes in that field. Pain researchers are just beginning their journey on that path. We are already thinking of pain not as a symptom but as a disease, and we are now examining a growing number of potential targets—including those at sites where pain originates, along various transduction pathways, and in the brain, where individuals experience pain."

Table 2 Selected New Opioid Formulations Under Investigation for Acute and Chronic Pain*

Agent *(Manufacturer/Sponsor)*	Description/Mechanism of Action	Indication/Comments	Status
ALO-02 (*Pfizer*)[11]	Small molecule; combination of oxycodone and naltrexone, extended-release formulation	Chronic pain, abuse-deterrent formulation	NDA filed
CEP-33237 (*Teva*)[12]	Small molecule; hydrocodone extended-release formulation	Chronic pain, abuse-deterrent formulation	NDA filed
CL-108 (*Charleston Laboratories*)[13]	Small molecule; combination of hydrocodone, acetaminophen, promethazine	Osteoarthritis; moderate-to-severe pain, reduced opioid-induced nausea and vomiting	Phase 3
CR845 (*Cara Therapeutics/ Enteris BioPharma*)[14,15]	Tetrapeptide/selective kappa-opioid agonist, peripherally acting	Acute and chronic pain; uremic pruritus (parenteral); chronic osteoarthritis pain (oral); anticipated low abuse liability	Phase 2/3
Egalet-001 (*Egalet*)[16]	Small molecule; morphine extended-release formulation	Chronic pain, abuse-deterrent formulation	Pre-NDA
MorphaBond ER (*Inspirion Delivery Technologies*)[17]	Small molecule; morphine extended-release formulation	Chronic pain, abuse-deterrent formulation	NDA approved
NKTR-181 (*Nektar Therapeutics*)[18]	Small-molecule polymer conjugate/mu-opioid receptor agonist; peripherally acting	Chronic pain, slower brain uptake, and anticipated lower abuse liability than reference oxycodone	Phase 3
Oliceridine, TRV130 (*Trevena*)[19]	Small-molecule G protein-biased mu-opioid agonist	Acute postoperative pain (parenteral); faster onset and stronger analgesia than morphine with lower adverse event profile, anticipated low abuse liability	Phase 2b
Xtampza ER (*Collegium Pharmaceutical*)[20]	Small molecule; oxycodone extended-release formulation	Chronic pain, abuse-deterrent formulation	NDA approved
Zalviso (*AcelRx*)[21]	Small molecule; sufentanil formulation	Acute postoperative pain (sublingual), preprogrammed, patient-controlled analgesia device; alternative to intravenous patient-controlled analgesia opioids	Phase 3

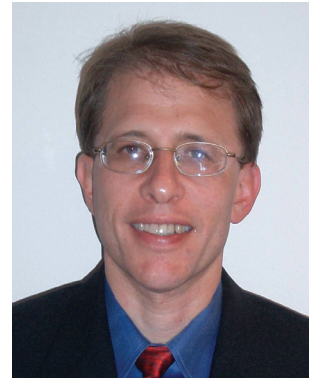
NDA = new drug application

*Selected from data provided by William K. Schmidt, PhD, President, NorthStar Consulting, LLC

Recategorizing Pain While Exploring Novel Targets

The search for compounds that are safer than opioids and yet can provide significant pain relief to fairly broad patient populations will require new ways of defining pain—a recategorization that is more in line with an individualized approach to pain management.

"Ultimately we want to be able to approach pain management in much the same way that we are already approaching treatment in other therapeutic areas," says Charles E. Argoff, MD, Professor of Neurology at Albany Medical College and Director of the Comprehensive Pain Center at Albany Medical Center in New York. "To give just one example, if a patient has an infection, let's say a urinary tract infection or a strep throat, the responsible agents can be cultured, and a list of antibiotics can be tested as part of that process. Afterward the health care provider receives a report that indicates which antibiotics will work best and which won't work. Nothing at all like that exists in the field of pain management. When a clinician selects from the best analgesics available, whether opioid or nonopioid, there is only at best a 50–50 chance that a particular agent will be effective."



Charles E. Argoff, MD

Dr. Argoff adds that even in a pivotal phase 3 clinical trial that ultimately leads to an FDA approval, less than 50% of all patients receiving a particular treatment will experience at least 30% pain relief. This is partly because clinical trial inclusion criteria frequently do not produce patient populations that are ideal for meaningfully testing a particular treatment. Accordingly, the field is moving away from categories of pain—such as those based on a particular diagnosis, injury, or anatomic location—that have proven to have limited utility in clinical research.

"Unfortunately, in medical school, and even in residency and beyond, what is still being taught are the standard categories of pain [Table 3]. There is still a tendency to think in terms of nociceptive versus neuropathic pain, for example. And this oversimplification ignores a great deal of what we already understand about the nervous system," Dr. Argoff says.

Researchers and clinicians are increasingly turning their focus toward the identification of pain phenotypes,[25,26] which incorporate detailed descriptions of pain (e.g., burning, stabbing, pricking, shooting) as well as specific clinical signs and information, such as the results of quantitative sensory testing.[27,28] Ultimately the identification of pain phenotypes should enable researchers and clinicians to better address underlying neural mechanisms of pain. While this is an exciting area of research, it is still relatively new; as Dr. Argoff notes, researchers are just beginning to learn how to assess pain phenotypes in a standard, rigorous way. Currently there is a lack of consensus on methods for defining, collecting, and reporting pain phenotypes,[25] and experts have yet to establish a taxonomy, or standardized language, for referring to specific phenotypes.

In another compelling area of pain research, a wide range of studies is more closely examining the changes that the central nervous system undergoes in response to pain, and how these changes affect both the brain and the entire body.

"Pain is not just a local phenomenon," Dr. Argoff says. "If an individual has pain, even localized pain—let's say an arthritic knee—that persists for any reason, that person's central nervous system will continue to receive ongoing information about pain transmission, and eventually may begin to learn to process that information much more quickly and more efficiently."

Depending upon genetic, environmental, and other unique influences, an individual's nervous system may become primed to have a heightened response to new painful stimuli—and in some cases, even to stimuli that are not typically regarded as painful. In patients with a condition such as mechanical allodynia,[29] for example, a heightened sensitivity to pain causes normally innocuous stimuli, such as a light touch, to be perceived as extremely painful. Researchers are examining the degree to which such "learning" by the nervous system, or strengthening of connections among nerve cells, plays a role in the transition from acute pain to chronic pain.[30,31] In 2015, the American Academy of Pain Medicine Foundation received funding to convene leading experts to examine this phenomenon in a study of acute pain. Dr. Argoff, president of the foundation, says the aim is to discover a method for "disconnecting" maladaptive learning, or a way to "pre-emptively strike" and thereby prevent chronic pain related to nerve injury.

As knowledge of signaling mechanisms, receptors, and pathways involved in the pathophysiology of pain deepens, researchers are identifying a variety of novel targets that may lead to more effective treatments for pain (Table 4). Among those currently attracting intense interest are voltage-gated

Table 3 Selected Pain Terminology[22–24]

The International Association for the Study of Pain defines pain as:

> An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.

Standard categories of pain include:

- **Nociceptive pain**—pain that arises from actual or threatened damage to nonneural tissue and is due to the activation of nociceptors (high-threshold sensory receptors of the peripheral somatosensory nervous system that can transduce and encode noxious stimuli). This term, designed to contrast with neuropathic pain, is used to describe pain occurring with a normally functioning somatosensory nervous system as opposed to the abnormal function seen in neuropathic pain.
- **Inflammatory pain**—pain in the presence of inflammation that is increased by pressure.
- **Dysfunctional pain**—maladaptive pain, typically triggered without an external stimulus, which does not serve a known protective function (e.g., pain associated with fibromyalgia, irritable bowel syndrome, and some types of headache).
- **Neuropathic pain**—pain caused by a lesion or disease of the somatosensory nervous system. Neuropathic pain is a clinical description (and not a diagnosis) that requires a demonstrable lesion or a disease that satisfies established neurological diagnostic criteria.

Table 4 Selected Emerging Nonopioid Treatments for Acute and Chronic Pain*

Agent (*Manufacturer/Sponsor*)	Description/Mechanism of Action	Indication/Comments	Status
AMG 334 (*Amgen/Novartis*)[32–35]	Biologic, fully human monoclonal antibody, CGRP receptor antagonist	Chronic migraine prevention (SC monthly dosing)	Phase 3
Baricitinib (*Lilly/Incyte*)[36]	Small molecule; balanced JAK1 and JAK2 inhibitor	Rheumatoid arthritis; use as monotherapy or in combination with methotrexate	Phase 3
CINGAL (*Anika Therapeutics*)[37]	Biologic and small molecule; combination of sodium hyaluronate and triamcinolone hexacetonide	Knee OA; viscosupplement plus steroid (intra-articular injection)	Phase 3
Clazakizumab, ALD518 (*Alder BioPharmaceuticals*)[38]	Biologic; humanized IL-6 monoclonal antibody	Rheumatoid arthritis; patients who have experienced an inadequate response to tissue necrosis factor inhibitors	Phase 2b
Clonidine topical gel (*BDSI*)[39]	Small molecule; topical clonidine formulation	Painful diabetic neuropathy; topical application 3 times daily to feet	Phase 3
CNV1014802 (*Convergence/Biogen*)[40,41]	Small-molecule sodium channel blockade (Nav 1.7 selective)	Peripheral neuropathic pain, trigeminal neuralgia	Phase 2
Fasinumab, REGN475 (*Regeneron*)[42–44]	Biologic, fully human NGF monoclonal antibody	OA of the hip or knee (parenteral dosing)	Phase 2/3
Filgotinib, GLPG0634 (*Galapagos*)[45]	Small molecule; highly selective JAK1 inhibitor	Rheumatoid arthritis	Phase 3
Fulranumab (*Janssen*)[46]	Biologic, humanized NGF monoclonal antibody	OA of the hip or knee (SC dosing every 4 weeks)	Phase 3
Hydros-TA (*Carbylan*)[47]	Biologic and small molecule; combination of hyaluronic acid and triamcinolone acetonide	Knee OA; viscosupplement plus steroid (intra-articular injection)	Phase 3
Invossa, TissueGene-C, TG-C (*Kolon Group*)[48]	Biologic; allogeneic cell therapy (cartilage cells plus cells with a growth factor promoting cell differentiation)	Knee OA (intra-articular injection)	Phase 3
Ixekizumab (*Lilly*)[49]	Biologic; humanized immunoglobulin G4-type monoclonal antibody to IL-17	Psoriatic arthritis, plaque psoriasis (SC injection biweekly or every 4 weeks)	Phase 3
Lesinurad (Zurampic) (*AstraZeneca*)[50]	Small molecule; selective uric acid reabsorption inhibitor that inhibits the URAT1 transporter	Gout; used in combination with febuxostat (xanthine oxidase inhibitor)	NDA approved
LY2951742 (*Lilly*)[51,52]	Biologic, humanized monoclonal antibody, CGRP receptor antagonist	Episodic and chronic migraine, cluster headache prevention (SC monthly dosing)	Phase 3
Sarilumab (*Sanofi/Regeneron*)[53]	Biologic, fully human monoclonal antibody targeting IL-6	Rheumatoid arthritis (SC dosing every 2 weeks)	Phase 3
Secukinumab, Cosentyx, AIN457 (*Novartis*)[54–57]	Biologic; fully human monoclonal antibody, selective IL-17A inhibitor	Ankylosing spondylitis, psoriatic arthritis, plaque psoriasis (SC or IV dosing, weekly, biweekly, or monthly dosing)	NDA approved
Tanezumab (*Pfizer/Lilly*)[58,59]	Biologic, humanized NGF monoclonal antibody	OA, chronic low back pain, cancer pain (SC dosing every 8 weeks)	Phase 3
TNX-102 (*Tonix*)[60]	Small molecule; cyclobenzaprine formulation	Fibromyalgia (sublingual dosing daily at bedtime)	Phase 3

CGRP = calcitonin gene-related peptide; IL = interleukin; IV = intravenous; JAK = Janus family kinase; NDA = new drug application; NGF = nerve growth factor; OA = osteoarthritis; SC = subcutaneous; URAT = uric acid transporter.

*Selected from data provided by William K. Schmidt, PhD, President, NorthStar Consulting, LLC

sodium channels, which have been proven to play a significant role in the processing of pain.[61] Studies of particular isoforms of these channels—particularly Nav 1.7, 1.8, and 1.9,[62] their patterns of expression (especially in the peripheral nervous system), and the effects of mutations in the genes that code for them—are expected to lead to the development of highly selective treatments for pain, with far fewer adverse effects than current treatments.

Among notable compounds under investigation that may lead to similarly targeted pain relief are inhibitors of nerve growth factor,[63] calcitonin gene-related peptide (CGRP) antibodies,[64] and interleukin-6 inhibitors[65] (Table 4). While the list of potential targets is expanding rapidly, researchers continue to face considerable hurdles in the translation of analgesic efficacy from animal models to humans.

A growing trend toward personalized medicine in the field of pain research has intensified efforts to improve the ability to predict whether a particular individual will respond to a given treatment. At Albany Medical College, Dr. Argoff and colleagues have recently completed several studies examining keratinocytes (skin cells) of patients with diabetes and fibromyalgia, to determine how they might be used to predict responses to a number of medications.[66]

"Keratinocytes are neurological powerhouses," Dr. Argoff says. "They contain so many different neuropeptides and receptors and ion channels, all of which undergo changes over time. We have been examining subtypes of sodium channels in these cells, and exploring whether the density of these subtypes affects the likelihood that patients will respond to particular drugs, such as topical lidocaine."

While pain treatments with broad indications would certainly have value, Dr. Argoff says, it is unlikely that a new compound would effectively treat most individuals with pain. "It's essential to develop affordable and standardized processes for determining who is likely to respond to a treatment, so that patients will suffer less by not having to experience failures. It doesn't matter to me if 80% of patients in a study responded to a new compound. What matters to me is whether the patient in front of me responds."

An Integrated Approach to Undertreatment of Pain

While patients and clinicians await the development of more effective drugs to treat pain, many patients continue to receive ineffective treatments or are unable to gain access to appropriate treatments. The suffering experienced by these patients continues to result in greater medical costs, in an enormous loss of productivity, and in a significant reduction in quality of life.[2] For these reasons, as the IOM report stated in 2011, effectively treating pain must be considered a moral imperative.[1]

Richard Payne, MD

"The undertreatment of pain is a huge problem," says Richard Payne, MD, Professor of Medicine and Divinity at Duke University, the John B. Francis Chair in Bioethics at the Center for Practical Bioethics, and a member of the panel that produced the 2011 IOM report. "Health care professionals have a critically important responsibility and obligation to address this problem. However, that does not mean that all undertreated pain must be addressed with medication. We have significantly underresourced, understudied, and underfinanced all of the other approaches that together would contribute to the comprehensive management of pain."

Undertreatment of pain can be traced to a wide range of factors, says Dr. Payne, many of which are addressed in the National Pain Strategy. These include a lack of communication between patients and clinicians, a lack of knowledge about pain and its treatment on the part of both patients and providers, and stigma associated with suffering from pain and with medications taken to treat pain.[1,2]

In an effort to address these factors, Dr. Payne regularly collaborates with industry to develop educational programs for clinicians who treat pain. These programs help clinicians adopt better communication skills and better approaches to assessing pain, and guide them in teaching patients—especially those in underserved communities—about pain medications and how to navigate the medical system. Yet even with appropriate training, clinicians face significant obstacles when it comes to effectively treating patients with pain.

"Nonpharmacologic treatments, such as behavioral approaches to pain management, are an essential component of any comprehensive pain program, but are simply not always available to patients who need them, or to physicians who wish to prescribe them," Dr. Payne says. "Currently there are not reliable means for accessing, coordinating, and getting reimbursed for these services. This is a huge health policy failure, because we have data to show that comprehensive approaches—the integration of physical, behavioral, social, and medical approaches—actually do work."

New investigations of nonpharmacological approaches continue to build upon the success of earlier complementary and/or integrative treatments; they include explorations of a range of unique interventions, many of which recognize physical and psychological distress as both responses to pain and factors that contribute to the experience of pain.[67,68]

"Multidisciplinary pain management clinics existed in the past," says Dr. Payne, a past president of the American Pain Society, "but have largely disappeared because insurers were unwilling to pay for them and hospitals and health systems were unwilling to sustain them. Re-establishing, promoting, and sustaining such multidisciplinary care would help address the undertreatment of pain and also put a lot less pressure on physicians to prescribe opioids. Opioids are often the default treatment because they are readily available and frequently inexpensive."

Dr. Payne and many of his colleagues point to reluctance on the part of insurers to cover the costs of multidisciplinary care as an illustration of short-term thinking, a position that ignores the enormous costs associated with the inadequate treatment of chronic pain.[1,2,69] Further research, they hope, will generate the data necessary to support the use of these treatments. Data collection so far has been limited, partly because until recently pain was not seen as a disease in its own right, but rather as a symptom of a wide range of other diseases. Consequently, pain as a therapeutic area has lacked its own institution or home within the NIH, as well as means for centralized data collection. Although the Interagency Pain Research Coordinating Committee (IPRCC) and task forces convened by the NIH Pain Consortium are devoted to advancing the field of pain management, many experts say that the lack of a bureaucratic hub has significantly limited funding and hampered the collection of data.

A member of the IPRCC, Dr. Payne says that things are slowly beginning to improve. A major goal of the IPRCC, for example, is to "put into place a mechanism to attract and encourage creative investigators and knowledgeable reviewers to evaluate pain research proposals." Public–private partnerships also are in the process of developing new mechanisms for data collection.

"Once the National Pain Strategy is disseminated to the public, I hope things will begin to change," says Dr. Payne. "I also look forward to reports by CMS [the Centers for Medicare and Medicaid Services] on current demonstration projects that are assessing the efficacy of multidisciplinary pain clinics. Data from these reports may encourage Medicare and other payers to begin paying for these services. The treatment of pain will improve when patients begin to have access to a whole range of treatments designed to improve their psychological and physical functioning."

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