

According to the American Institute of Pain Medicine report and subsequent National Pain Strategy, pain affects 100 million Americans and costs our country more than half a trillion dollars annually. We have a greater appreciation for the complex nature of pain and how it can become a disease in itself. As such, more efforts should be made to address chronic pain prevention and the need for medical intervention for more chronic pain problems. For precision pain medicine to be successful, we must link the health system to [chronic pain](#) biomarkers (e.g genomics, proteomics, patient-reported outcomes, brain markers).

Our [growing](#) knowledge of the mechanisms and factors involved in the multidimensional nature of pain has improved our understanding of pain patient care. We have improved operations, interventional procedures, medications, psychological interventions, [physical therapy](#), and complementary approaches. We also increasingly appreciate the need for an interdisciplinary, team approach to optimize [pain management](#), especially for more complex cases. This improvement in our treatment approach is even more important because of the current prescription opioid epidemic. In fact, opioids continue to be moved down the list of approaches as more effective treatments are identified.

Despite this progress, millions of people suffer from pain, costing society billions of dollars. Where do we go from here? Two recent national publications show a clear path for the future of pain assessment, prevention, management, and research. First up is the Institute of Medicine's [Pain Relief](#) in America report, which provides a high-level view and the way forward. The second, the National [Pain Strategy](#), outlines how to achieve optimal pain assessment, prevention and treatment insights. Both of these will be discussed with an emphasis on relevant information for the readers of this journal.

Awareness about the pain

To talk about the issue of pain, we put forward that our country must implement a population-level precaution and [management](#) strategy along with developing a inclusive strategy with particular aims, activities, investors and timeframes. This plan should:

- Height alertness about aching and its health concerns;
- emphasize the prevention of pain;
- Develop pain evaluation and management in the transfer of wellbeing and funding programs organized by the federal government;
- Use community fitness plans to advise patients on how to cope with their own aching.

Exploring the future of Pain Management; emerging therapies and techniques

The IOM pain report calls for tailoring pain care to each individual's experience, emphasizing self-management whenever possible. Missed assessment, chronic pain and care for those with complex pain should be more financially incentivized and promoted. In addition, education between both people with pain and their caregivers should be strengthened. The IOM pain report called for a redesign of educational programs to understand the complex biological and psychosocial aspects of pain and a multimodal approach to treatment. Redesign the pain curriculum to include surgery, medicine, physical and occupational therapy, nursing, and all other pain care teams. Although we call for more research into the mechanisms responsible for pain and the development of safe and effective treatments, we recognize that the available knowledge is rich. We need to ensure that this education is shared with people in pain and their caregivers.

In conclusion, the IOM committee noted that research has made significant progress in characterizing biological, cognitive, and psychological mechanisms, and that future progress in genomics and cell-behavioral mechanisms will lead to some progress. However, many gaps remain and the development of more effective and less risky pain treatment remains a major challenge. There are additional challenges in translating mechanistic knowledge into treatment because of regulatory barriers. The IOM pain report calls for better coordination with NIH agencies and centers by improving decision-making on pain recommendations and exploring a range of public-private initiatives.

National pain strategy

The expert working group, led and coordinated by the Monitoring Group, explored the six key areas identified in the IOM recommendations - population outreach, prevention and treatment, disparities, service delivery and compensation, education and professional training, public awareness and communication.

Population studies

The IOM report noted that more than 100 million Americans experience some level of chronic pain. This number includes people with mild to moderate chronic pain who are severely affected by their pain. Therefore, it is important to distinguish people with high-impact chronic pain from people who continue to do normal activities despite experiencing chronic pain. To achieve this goal, the NPS first introduced the term "chronic pain-high impact" and defined as "pain associated with significant limitation of participation in work, social, or self-care activities up to half a year or further."

Prevention and Care

The Prevention and Care Task Force says we need to focus more on preventing [acute and chronic pain](#) throughout the health care system, in areas of high risk of injury, and for people at high risk of developing chronic pain. This is especially important for people who

care for people with hand conditions. There is a call for more standardized assessment tools and outcome measures through the development of new approaches, rigorously researched.

Disparities

The disparities task force noted that pain is more prevalent in groups that include people with limited access to health care, racial and ethnic minorities, people with low incomes or low education, and groups at increased risk because of where they live or work. NPS recommends efforts to improve the understanding of bias and support effective strategies to overcome it; improving access to quality pain care for vulnerable populations; improvement in communication between patients and health professionals.

Telemedicine Technology for Pain Medicine

Virtual health and mobile applications have been designed to improve care delivery and patient-provider communication, and the impact of these applications is emerging in the literature. Automated text messaging has been shown to be a promising method for monitoring opioid use after surgery.

Biotechnology and Pharmaceuticals

Advances in biotechnology have spurred the development of new drug therapies. Gold nanorods conjugated with TNF siRNA have been shown to [reduce thermal pain](#) in mice. Tramadol hydrochloride attached to nanoparticles with endogenous ligands was found to have improved pharmacokinetic properties, including longer release time and proliferation compared to tramadol alone. Another technique under investigation is magnetofection: the intrathecal injection of magnetic gold-iron nanoparticles that can bind to specific antibodies and target them using a magnetic field. Voltage-controlled microfluidic devices can provide precise long-term control of drug release, creating personalized treatment protocols for chronic pain. Automated patch clamp (APM) is the most valuable technology in pain research and can record ion channel potentials with greater throughput than conventional manual techniques.

Future strategies for pain management

The future of pain assessment, prevention, and treatment will require improvements in clinical education, public and institutional policy, and population-level epidemiology, health care, social sciences, medical informatics, implementation, basic biomedical, and other

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relevant research, informed by physicians.

As mentioned earlier, despite the increasing number of pain medications available, more than 100 million people in the United States still live with pain. Little is known about which treatments work best for patients, or about the effectiveness and safety of different treatments over time. This call for consistent patient registration is the recognition that the Health System (LHS) is an important aspect for the future of medicine. The Institute of Medicine recently highlighted the benefits of LHSs [2013] and in 2013 the National Science Foundation held a workshop announcing that LHSs can quickly inform decisions that have transformative effects on improving health.