Mechanisms and Management of Pain in the Elderly

Workshop Executive Summary

On June 30 and July 1 of 2008, the National Institute on Aging (NIA), in collaboration with a number of National Institutes of Health (NIH) Pain Consortium (http://painconsortium.nih.gov) Institutes and Centers, held an exploratory workshop on the mechanisms and management of pain in the elderly. NIA Director, Dr. Richard Hodes, gave the opening remarks on the morning of the first day, addressing the NIA's interest and commitment to the understanding of pain and aging. Dr. Patricia Grady, Director of the National Institute of Nursing Research (NINR), gave the opening remarks on behalf of the NIH Pain Consortium on the morning of the second day of the workshop.

Pain is one of the most common reasons for physician visits in general and costs associated with pain are extremely high. Epidemiological studies have shown that the prevalence of pain among elderly in the age range of 75-86 years is at least 5 times as high as the prevalence in the 25-34 years age group. Despite the recent growth in the understanding of the molecular entities and neural pathways involved in pain sensation and experience in the periphery and central nervous systems, few of these advances have been translated into understanding of the mechanisms, assessment, or treatment of pain conditions specifically targeted to the elderly population.

To identify the gaps, barriers, and opportunities for aging research on pain mechanisms, assessment, and treatment/management, this exploratory workshop convened 30 leading experts in various aspects of pain research as well as geriatricians working on issues related to pain. The workshop explored three major themes, *the Complexity of Pain in the Elderly*, *Assessment and Measurement of Pain in the Elderly, and Treatment and Management of Pain in the Elderly.* These three themes were divided into eight sessions over the two-day meeting.

The first theme on *the Complexity of Pain in the Elderly* started with an *Overview* session, which was presented by Drs. Debra Weiner, Arthur Stone and Carmen Green, to give a conceptual framework on the biological, psychological and social issues related to pain in older adults. The second session was on *the Biology of Pain in the Elderly*, and the speakers included Drs. David Julius, Jon Levine, Anne Louise Oaklander and Pierre Rainville, who presented in the areas of the mechanisms underlying peripheral detection of nociceptive pain, inflammatory pain and aging, neuropathic pain and central processing and modulation of pain. Session 3 was presented by Drs. Richard Chapman, Susan Charles, Monique Cherrier and Suzanne Leveille to give *Psychological, Physiological and Functional Perspectives on the Vulnerability to Chronic Pain*, in particular for the elderly population. It became quite evident from the presentations and discussions at the first three sessions that pain is a serious condition for older adults and affects their physiological, psychological and social well-beings significantly. In addition, a majority of the people who suffer from chronic pain tend to be older people. **However, very little is known about how aging affects parts of the nervous system that detect and transmit painful stimuli and**

express painful experiences at a mechanistic level. As one of the speakers pointed out, understanding pain and aging at this mechanistic level by itself would be an important direction to pursue.

The second theme focused on *the Assessment and Measurement of Pain in the Elderly*. In the *Clinical Assessment of Pain in the Elderly* session, Dr. Stephen Gibson from Australia presented his recent work using neuroimaging techniques to interrogate the structural and functional differences among young adults, cognitively normal older adults and Alzheimer's patients when they were exposed to painful stimuli. Dr. Lynn Snow discussed the challenges facing self-report and behavioral assessment of pain in demented patients. The subsequent five talks by Drs. Jay Shah, James Witter, Molly Wagster, Clifford Woolf and Mitchell Max presented some of the cutting edge approaches and methods in clinical pain assessment, including *in vivo* biochemical analysis using microdialysis, NIH-initiated assessment projects for use in large scale clinical or epidemiological studies such as PROMIS, and the NIH Toolbox that include self-report-based measures of pain, a new paradigm called Pain Fingerprint, which is a mechanism-based clinical pain assessment approach, and genetic/genomic association studies of pain. **It remains to be ascertained whether any of these new approaches and methods could be further developed for the assessment of pain in older adults.** In the *Animal Models of Pain Measurement* session, Dr. Robert Yezierski presented his recent work on developing a new animal model for pain measurement that might be suitable for aging studies, while Dr. William Lariviere discussed a variety of pain models in rodents and their relationships to clinical pain assessments**. It became clear that there was a void in understanding the impact of aging on pain assessment and measurement in a variety of clinically relevant pain animal models.**

The third theme was on the *Treatment and Management of Pain in the Elderly*. It began with a session on *Pharmacological Approaches to Pain Treatment*, which was first discussed by Drs. Joseph Hanlon and Srinivasa Raja to address the current understandings of pharmacotherapy of pain in the elderly along with considerations about side effects and drug interactions. Then, Dr. Joachim Scholz presented strategies for targeted pain treatment and Dr. David Borsook discussed the applications of neuroimaging tools to diagnose pain and assess drug efficacy. The session on *Non-Pharmacological Approaches to Pain Treatment* addressed topics such as physical rehabilitation medicine, cognitive-behavioral therapy, hypnosis, biofeedback and real-time functional Magnetic Resonance Imaging (fMRI) as well as deep brain stimulation, and the speakers included Drs. Joseph Audette, Ivan Molton, Jon Hawkinson and Morten Kringelbach. **For almost every approach, little is known about its effectiveness and efficacy for pain treatment in the elderly population.** In the final session of the workshop on *Pain Management from Individual to System,* two types of pain that are particularly prevalent in the elderly were highlighted - osteoarthritis pain and ischemic pain - by Drs. Tuhina Neogi and Edwin McCleskey, respectively. Dr. Ray Dionne presented the concept of individual variability of pain therapy and Dr. Sean Morrison discussed his view on palliative care for seriously ill older adults.

The workshop was attended by more than 75 scientists including NIH extramural and intramural staff and non-NIH researchers. A full-length workshop report will be generated and made available through the NIA website as well as the NIH Pain Consortium website. (For more information, contact Dr. Wen G. Chen, Division of Neuroscience, NIA/NIH, Phone: 301-496-9350; chenw@nia.nih.gov)

Mechanisms and Management of Pain in the Elderly

June 30-July 1, 2008

Doubletree Hotel
8120 Wisconsin Avenue
Bethesda, MD 20814

Workshop Sponsorship

National Institute on Aging (NIA)
Division of Neuroscience (DN)
Division of Geriatrics and Clinical Gerontology (DGCG)
Division of Behavioral and Social Research (DBSR)
National Center for Complementary and Alternative Medicine (NCCAM)
National Institute on Drug Abuse (NIDA)
Division of Neuroscience and Behavioral Research
NIH Pain Consortium

Organizing Committee

NIA-DN: Wen Chen, Andrew Monjan, Marcelle Morrison-Bogorad, Molly Wagster
NIA-DGCG: Basil Eldadah, Evan Hadley, Susan Nayfield
NIA-DBSR: Lisbeth Nielsen, Sidney Stahl
NIH Clinical Center: Ann Berger
NIDA: David Thomas
NIDCR: John Kusiak
NINDS: Linda Porter
NINR: Raymond Dionne

Monday June 30, 2008

8:00 a.m. **Breakfast**

8:30 a.m. **Welcome Remarks** *Richard Hodes, Director of the NIA*

8:35 a.m. **Orientation** *Wen Chen, NIA/NIH*

THEME ONE COMPLEXITY OF PAIN IN THE ELDERLY

SESSION 1 OVERVIEW OF RESEARCH ON PAIN IN THE ELDERLY: BIOPSYCHOSOCIAL CONSIDERATIONS

8:40 a.m. **Mechanisms and Management of Pain in Older Adults: A Conceptual Framework**

Debra Weiner, University of Pittsburgh

9:00 a.m. **Social and Economic Profile of Pain**

Arthur Stone, State University of New York-Stony Brook

9:20 a.m. **Discussions**

Carmen Green, University of Michigan Medical School

9:40 a.m. **Break**

SESSION 2 BIOLOGY OF PAIN IN THE ELDERLY

9:50 a.m. **Peripheral Detection of Nociceptive Pain**

David Julius, University of California-San Francisco

10:10 a.m. **Mechanisms of Inflammatory Pain and Aging**

Jon Levine, University of California-San Francisco

10:30 a.m. **Neuropathic Pain**

Anne Louise Oaklander, Harvard Medical School

10:50 a.m. **Central Processing and Modulation of Pain**

Pierre Rainville, Université de Montréal, Canada

11:10 a.m. **Discussions**

Linda Porter, NINDS/NIH

11:30 a.m. **Lunch Break**

Session 3 Vulnerability to Chronic Pain: Psychological, Physiological and Functional Perspectives

12:30 p.m. **A Psychophysiological Systems View of Pain**

C Richard Chapman, University of Utah School of Medicine

12:50 p.m. **Connections between Pain, Emotional Experience and Personality: Painfully Obvious or Perplexing Puzzle?**

Susan Charles, University of California-Irvine

1:10 p.m. **Cognitive Consequences of Pain in the Elderly**

Monique Cherrier, University of Washington

1:30 p.m. **Functional Consequences of Pain in the Elderly**

Suzanne Leveille, Harvard Medical School

1:50 p.m. **Discussions**

Lisbeth Nielsen, NIA/NIH

2:10 p.m. **Break**

THEME TWO ASSESSMENT AND MEASUREMENT OF PAIN IN THE ELDERLY

SESSION 4 ASSESSMENT OF PAIN IN THE ELDERLY

2:25 p.m. **Neuroimaging Pain in the Elderly**

Stephen Gibson, National Ageing Research Institute, Australia

2:45 p.m. **Self-Report and Behavioral Observational Assessment of Pain in Persons with Dementia**

A Lynn Snow, University of Alabama and Tuscaloosa VA Medical Center

3:05 p.m. **Uncovering the Biochemical Milieu of Myofascial Trigger Points Using *In-Vivo* Microdialysis**

Jay Shah, Clinical Center/NIH

3:25 p.m. **New Assessment Tools -- PROMIS/NIH Toolbox**

James Witter, NIAMS/NIH; Molly Wagster, NIA/NIH

3:45 p.m. **Pain Fingerprints - a New Paradigm in Clinical Pain Phenotype Assessment**

Clifford Woolf, Harvard Medical School

4: 05 p.m. **Genetic Association Studies of Pain and Its Complications**

Mitchell Max, University of Pittsburgh School of Medicine

4:25 p.m. **Discussions**

Wendy Smith, Office of Science Policy/Office of the Director/NIH

4:45 p.m. **Break**

Session 5 Animal Models of Pain Measurement

5:00 p.m. **Effects of Age on Pain Sensitivity: Models of Pain Assessment**

Robert Yezierski, University of Florida

5:20 p.m. **Pain Models in Rodents: Relationships among Pain Types and Relatedness to Clinical Pain**

William Lariviere, University of Pittsburgh School of Medicine

5:40 p.m. **Discussions**

Conan Kornetsky, Boston University

6:00 p.m. **Adjourn for Day One**

Tuesday July 1, 2008

8:00 a.m. **Breakfast**

8:30 a.m. **NIH Pain Consortium** *Patricia Grady, Director of the NINR*

Theme Three Treatment and Management of Pain in the Elderly

Session 6 Pharmacological Approaches for Pain in the Elderly – the Current and the Future

8:50 a.m. **Pharmacotherapy of Pain in the Elderly**

Joseph Hanlon, University of Pittsburgh

9:10 a.m. **Treating Pain in the Elderly: The Delicate Balance between Efficacy *versus* Adverse Reactions and Drug Interactions**

Srinivasa Raja, Johns Hopkins University School of Medicine

9:30 a.m. **Strategies for Targeted Pain Treatment**

Joachim Scholz, Massachusetts General Hospital

9:50 a.m. **Can Imaging Provide Useful Insights into Pain Diagnosis and Treatment?**

David Borsook, Harvard Medical School

10:10 a.m. **Discussions**

David Thomas, NIDA/NIH

10: 30 a.m. **Break**

Session 7 Non-pharmacologic approaches to pain therapy

10:40 p.m. **Integrative & Physical Medicine Approaches to Pain Management**

Joseph Audette, Harvard Medical School

11:00 a.m. **Cognitive-Behavioral, Hypnotic, and Biofeedback Approaches for Chronic Pain in the Elderly**

Ivan Molton, University of Washington

11:20 a.m. **Real-time fMRI for Treating Pain**

Jon Hawkinson, Omneuron Inc.

11:40 a.m. **Deep Brain Stimulation for Pain Treatment**

Morten Kringelbach, Oxford University

12:00 noon **Discussions**

Ann Berger, Clinical Center/NIH

12:20 p.m. **Lunch Break**

Session 8 Pain management from individual to system

1:10 p.m. **Osteoarthritis Pain**

Tuhina Neogi, Boston University Medical Center

1:30 p.m. **Detection of Ischemic Pain**

Edwin McCleskey, Howard Hughes Medical Institute

1:50 p.m. **Individual Variability of Pain Therapy**

Ray Dionne, NINR/NIH

2:10 p.m. **Pain, Palliative Care, and Seriously Ill Older Adults**

R. Sean Morrison, Mount Sinai School of Medicine

2:30 p.m. **Discussions**

Carmen Green, University of Michigan Medical School

3:00 p.m. **Adjourn for the Workshop**