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Life in Discovery

For Immediate Release:

## Clinical Psychologist Explores Physiological and Cognitive Factors that Link Negative Emotions with Physical Pain



John W. Burns, Ph.D., began his career focused on mental stress and cardiovascular functioning and disease, but he soon found his niche in the field of emotion regulation and pain.

A Professor in the Department of Psychology of the College of Health Professions at Rosalind Franklin University of Medicine and Science, Dr. Burns' research falls largely within the field of behavioral medicine.

Dr. Burns reminds us that pain has the vital function of telling a person to pay attention to something right away (e.g., "Take your hand off of the stove!"). "Pain is absolutely vital to our being able to function in the world. It would be a disaster if you couldn't feel pain," he says. "Still, it is important to consider that pain 'messages' from skin, muscle, bone, and gut are processed through regions of the brain responsible for emotions, memory and higher cognitive functions. We don't

just sense pain – we modulate and interpret the message conducted by nerves to ultimately produce a range of responses."

Research indicates that emotional and behavioral responses to pain are shaped by a complex interplay of nature and nurture. On one level, genetic and physiological factors work to affect responses to pain, while on another level, culture, family modeling, and learning history also affect responses. Dr. Burns believes that researchers typically delve into one level or another to explore pain, but that greater understanding may be fostered by bridging, for example, genetic and physiological "strata." Thus, he has spent the last decade examining the cognitive, physiological and genetic mechanisms by which anger – in particular – affects the intensity of acute and chronic pain.

Dr. Burns notes that problematic anger regulation (the tendency to verbally and physically express anger; so-called “anger-out”) and pain sensitivity are correlated in both healthy people and those suffering from chronic pain. In an ongoing project funded by a grant from the National Institutes of Health, Dr. Burns, his students and a colleague at Vanderbilt University have been exploring whether anger-out and perceived pain intensity are linked via a common deficit in a bodily system responsible for reducing stress and pain sensitivity -- endogenous opioids.

“In an early peek at the data, we are finding that when subjects’ endogenous opioid functioning is blocked pharmacologically, anger arousal leads to much greater subsequent pain than when opioids are functioning normally.”

Results show that emotional arousal may influence how much pain a person perceives because of how well other physiological systems are working.

Although pain has an adaptive alarm function, for people with chronic pain; however, it’s not just a survival mechanism.

“Pain gets in the way of their everyday life,” says Dr. Burns.

Chronic pain is reported to be among the most costly health problems in America. Estimated annual costs, including direct medical expenses, lost income, lost productivity, compensation payments, and legal charges, are about \$90 billion, according to the National Institutes of Health.

Dr. Burns’ research has focused on chronic low back pain. “In many cases, the causes of persistent low back pain is not well-understood by the patients’ physicians, PTs, case managers, families or the patient him/herself,” notes Dr. Burns. “In short, the reason the pain and suffering persists is a mystery.”

Family and friends often find it trying to maintain support for chronic pain patients over the long term. He notes that there are a lot of people experiencing chronic pain and marital discord, and that this field is completely understudied.

“Unless you have a bone sticking out or a similar obvious injury, people are often supportive for the first week or month,” Dr. Burns says. “But after six months or longer living with someone with chronic, ‘mysterious’ pain, the social support from spouses and friends might start to wear out.”

Dr. Burns recently received \$1.7 million in grant support from the National Institute of Health, eager to begin a study this fall that digs deep into the interactions among low back pain patients and their spouses. He and colleagues from Duke University and the University of Notre Dame will examine married patients aged 18-55 who have chronic low back pain, many of whom will be experiencing marital problems that often are associated with living with a spouse afflicted with chronic pain. Given that the causes of a patient’s pain and disability (reduced ability to work and play) may be poorly grasped by spouses, critical and hostile attitudes toward patients often do develop.

“Such things are simply NOT good for the couple,” says Dr. Burns. “The goal of the study is to investigate the ways in which spouse hostility and criticism toward the patient are linked to patients’ displays of pain behaviors and sour mood.”

The project involves both intricate laboratory studies and a daily diary study. In the lab studies, patients and spouses (80-100) will participate in conflictual and nonconflictual marital discussions, and patients

will perform painful everyday tasks – all while being videotaped. The researchers will code these tapes for critical comments and observable pain behaviors.

They will test whether spousal hostility/criticism (first) leads to increased patient pain behaviors and poor mood (second), and/or whether patient displays of pain behaviors (first) leads to increased spouse hostility/criticism and rejection (second). They will also test whether certain spouses, patients and/or couples are more prone to one pathway than the other.

The daily diary study involves giving 80-100 patients and their spouses personal digital assistants (PDAs) for a week to use for entering data about the patient's anger and mood levels and, conversely, when the spouse is critical of or hostile to the patient.

Knowing a bit more about how and when the hostility starts and how the patient's pain increases or wanes will allow scientists to develop better interventions for patients, spouses and families to help enrich the relationships and increase beneficial support for the patient.

“Such interventions would be geared toward people struggling to accommodate chronic medical conditions into the couple or family,” said Dr. Burns. “This is a new area for me, but I am enthusiastic about the study and for potential expansion of this research program into clinical trials of couples-based interventions.”

Dr. Burns' hope is that people involved in pain medicine, from family practice physicians to anesthesiologists to podiatrists, would take advantage of the burgeoning research literature on the cognitive, emotional and social factors that appear to influence to a staggering degree how people respond to pain.

Dr. Burns has written or contributed to more than 46 peer-reviewed publications, including *Pain*, *Journal of Consulting and Clinical Psychology*, *Journal of Behavioral Medicine* and *Psychosomatic Medicine*.

#### ***About Rosalind Franklin University of Medicine and Science***

*Rosalind Franklin University of Medicine and Science is a national leader in interprofessional medical and healthcare education, comprising the Chicago Medical School, College of Health Professions, Dr. William M. Scholl College of Podiatric Medicine and School of Graduate and Postdoctoral Studies.*

*Rosalind Franklin University recently received approval for its new doctoral program in Interprofessional Healthcare Studies – the first in Illinois – and will launch a new master in science program in Psychology Clinical Counseling in fall 2008.*

*There are more than 16,000 RFUMS graduates in the United States and worldwide.*