PAINS project

This annotated bibliography was assembled to support PAINS' year-end report, *Lost in Chaos: The State of Chronic Pain in 2016*. Articles included focus on chronic pain, the opioid epidemic, and behavioral health. Those included represent only a small portion of work published over the past two years. It is our hope that this bibliography will provide an overview of the current literature and spark curiosity that will lead to further research.

Chronic Pain

Alford, Daniel P. "Opioid Prescribing for Chronic Pain–Achieving the Right Balance through Education." *The New England Journal of Medicine.* Vol. 374, No. 4. (2016): 301-303.

Dr. Daniel P. Alford is a Professor of Medicine and Director of the Safe and Competent Opioid Prescribing Education (SCOPE of Pain) program at the Boston University School of Medicine. He specializes in opioid use disorders and chronic pain management—including their interplay. This perspective piece was written with intent for medical professionals who prescribe opioids or treat pain. Dr. Alford opposes efforts to limit access to opioids, although he acknowledges that they are well intentioned. Rather than focusing on regulations that will create a "chilling effect" on physicians and create mistrust between a patient and provider, education should be one of the main tactics. He writes, "Though managing chronic pain is complicated and time consuming and carries risk, we owe it to our patients to ensure access to comprehensive pain management, including the medically appropriate use of opioids."

Broderick, Joan E., Keefe, Francis J., Schneider, Stefan, et al. "Cognitive Behavioral Therapy for Chronic Pain is Effective, but for Whom?" *Pain*. Vol. 157, No. 9. (2016): 2115-123.

Joan E. Broderick is a Senior Behavioral Scientist and the Associate Director of the Center for Self-Report Science and Center for Economic & Social Research at the University of Southern California. This research paper was published for clinical psychologists, psychiatrists, and medical professionals who treat those with chronic pain—specifically for hip and knee osteoarthritis. This study found that in those treated with Pain Coping Skills Training (PCST), a type of cognitive behavioral therapy, only the ones with moderate to higher expectations benefitted. Also, these were the first results to show the substantial effectiveness for PCST among those with the most advanced osteoarthritis. Alternative therapies like this are important treatment options especially for older patients and those who have very limited treatment options for chronic pain.

Consumer Reports. "Pain Relief Now!" *ConsumerReports.org*. (2016).

This is an article published by *Consumer Reports*, a magazine published by the Consumers Union, about the abundance of opioid prescriptions, their high levels of misuse, what the current state of pain care is in America, and some of the issues that have arisen. The article acknowledges that opioids aren't a cure for pain, and there needs to be an implementation of an

"extensive toolkit" for those suffering from chronic pain. As they state that there isn't a quick fix to pain, they say real pain relief is "…about listening to what your body is trying to tell you, then patiently addressing the underlying cause." Patience and understanding that there are no "quick fixes" to chronic pain are two things that everyone in the pain community must accept. A glossary of treatments and a step-by-step treatment guide to the most common causes of pain are also included in this article.

Craner, Julia R., et al. "Current Medical Research and Opinion: Patients' Perceptions of a Chronic Pain Rehabilitation Program: Changing the Conversation." Vol. 32. Libra Pharm Ltd. (2016).

Julia R. Craner is a Clinical Health Psychologist in Primary Care at Spectrum Health Medical Group in the greater Grand Rapids, Michigan area. In this study, the authors look at the changes in thoughts of chronic pain patients undergoing a pain rehabilitation program with a biopsychosocial approach. Because there are many challenges associated with widespread chronic pain, the solutions to the problem have been difficult to identify. During the three-week intensive program, patients underwent supervised opioid tapering and withdrawal and a highly interdisciplinary and integrated model of care with a focus on increasing function rather than decreasing pain. At discharge, 88.7% of patients reported they had successfully tapered off their opioid medication, and the other 12.3% said they would complete their taper at home. Among the results, 84.7% endorsed relaxation strategies as the most important pain management skill they learned, specifically diaphragmatic breathing. Most reported significantly decreased pain severity and pain-related interference. Physical therapy, exercise, stretching, and a social aspect were all reported as important; and the participants had a decreased fear of pain. The authors note that patients can be skeptical of these behavioral pain management techniques and more research needs to be done to understand the best way a physician can recommend biopsychosocial interventions.

Dale, Rebecca, and Stacey, Brett. "Multimodal Treatment of Chronic Pain." *Medical Clinics of North America.* 100.1 (2016): 55-64.

Dr. Rebecca Dale is the fellowship Director of Pain Medicine and Assistant Professor in the Department of Pain Medicine and Anesthesiology at the University of Washington School of Medicine. Dr. Brett Stacey is the Medical Director at the Center for Pain Relief at the University of Washington Medical Center—Roosevelt. There are many treatment options for chronic pain, as chronic pain lends itself to a comprehensive treatment approach, but more data needs to be collected so the effectiveness of these alternative therapies can be known. More data needs to be collected on combination drug therapies, which medications are synergistic, and general multimodal therapies. Evidence has been found in favor of yoga, tai chi, and music therapy for the self-management of pain. Treatment goals of chronic pain include providing adequate and lasting reduction in suffering, minimization of side effects, and cost-effectiveness. The authors say treatment should be closely monitored, and it is implied that these treatments would be individualized, which is key in the efforts to treat and manage chronic pain.

Davey, Elizabeth S., "Anaesthesia and Intensive Care Medicine: Psychology and Chronic Pain." Vol. 17. Medicine Pub. Co. (2016).

Dr. Elizabeth S. Davey is a Consultant Clinical Psychologist at the Cumbria Partnership NHS Trust, UK. In her article, Dr. Davey explains how pain acts as negative reinforcement, and in chronic pain, stimuli that are not dangerous could begin to be associated with damage. When this happens, a person with chronic pain will begin to show fear-avoidance, which greatly impacts activity levels, anxiety, and behavior. Negative responses by medical professionals toward a pain patient can negatively affect the patient in various ways. Good communication must be established. She suggests that cognitive behavioral-based pain management programs are "evidence-based psychologically informed interventions" that can reduce the amount of disability if started early in the treatment/pathway. This supports the biopsychosocial view of chronic pain treatment through the use of proven cognitive behavioral therapy.

Dear, B.F., M. Gandy, E. Karin, T. Ricciardi, et al. "The Pain Course." *Pain.* Vol. 157.10. (2016): 2257-268.

Dr. Blake Dear is a National Health and Medical Research Council Research Fellow, clinical psychologist, Co-Director of the eCentreClinic, and Professor of Psychology at Macquarie University in Sydney, Australia. The study examined predictors of clinical response to an online pain management program called the Pain Course, which is described to help users learn cognitive behavioral therapy (CBT) skills and reduced pain-related disability, anxiety, and depression. The results of the study showed that a broad range of patients could benefit, but it couldn't be predicted by demographic, clinical, or psychological attributes. After the course, 19% and 25% had a greater than 30% improvement in average pain levels at the post-treatment and 3-month marks, respectively. This study further supports the benefits of cognitive behavioral therapy and the need for self-management of chronic pain. It also supports the effort to implement a comprehensive pain management strategy.

Dresner, D., et al. "Listening to Their Words: A Qualitative Analysis of Integrative Medicine Group Visits in an Urban Underserved Medical Setting." *Pain Med.* (2016).

Danielle Dresner, MPH, is associated with Boston University Family Medicine. In this study, the authors explored how Integrative Medicine Group Visits (IMGVs) affected patient health. The conclusions that the study reached were that by addressing both emotional and physiological health needs and providing a social aspect to help chronic pain patients feel like they're "not alone," the patients' abilities in self-monitoring, self-regulation, and mindfulness increased.

Forstag, Erin Hammers, and Rapporteur. "Pain Management and Prescription Opioid-Related Harms: Exploring the State of the Evidence: Proceedings of a Workshop—in Brief." *The National Academies Press*. (2016).

Erin Hammers Forstag is an independent medical writer and public health policy attorney in the Portland, Oregon area. This article serves as a summary of a workshop held by the Committee on Pain Management and Regulatory Strategies to Address Prescription Opioid Abuse that was

tasked with identifying actions the FDA and others could take to address the opioid epidemic and the individual need for pain control. Many different professionals with experience in both the pain and opioid abuse spaces gave presentations ranging from effectiveness of long-term opioid treatment to drug development funding. This article has high relevance because of the many opinions from leaders and policymakers being stated and recorded. Many of the attendees, along with Christin Veasley of the Chronic Pain Research Alliance said there needs to be a major investment in pain research.

Frank, JW, Levy, C., et al. "Patients' Perspectives on Tapering of Chronic Opioid Therapy: A Qualitative Study." *Pain Med.* Vol. 17.10. (2016): 1838-47.

Joseph W. Frank, MD, MPH is a general internist and health services researcher at the VA Eastern Colorado Health Care System. Along with his colleagues, he investigates patients' perceptions on tapering their chronic opioid therapy (COT) in in-person, semi-structured interviews. A driving factor of this study is their statement that there is inadequate evidence of the long-term benefit and effectiveness of COT along with more and more evidence of its risks. Of the 24 participants in the study, 25% were on COT and not tapering, 50% were currently tapering, and 25% had stopped COT completely. The barriers that were discovered were that they thought nonopioid treatment options would not be effective, and there was also a fear of withdrawal. With this information, the authors suggest that before starting an opioid tapering regimen, the patients' perceived barriers should be known and relationships with family, peers, and providers should be built.

Franklin, ZC, Smith, NC, Fowler, NE. "A qualitative investigation of factors that matter to individuals in the pain management process." *Disabil Rehabil.* Vol. 38.19. (2016): 1934-42.

Z.C. Franklin is from the Institute for Performance Research at Manchester Metropolitan University in Crewe, United Kingdom. This paper asks the question, "What are the main factors that influence individuals' experiences in the management of chronic pain?" Because the authors recognize that chronic musculoskeletal pain is very complex and has implications that range from physical disabilities to psychosocial effects and increased use of healthcare, they use data from patient interviews in order to get insight into the perspective of a chronic pain patient. They found that there were three main themes: the impact of their condition on their daily life, clinical interactions, and the pain management process. They also found there was also a need for good communication. Patients tended to want more frequent access to treatment services when they didn't have all of the information or didn't have enough time to discuss with their provider. More effective communication could make for better pain management and lessen the demand for care.

Houry, Debrah, and Baldwin, Grant. "Announcing the CDC Guideline for Prescribing Opioids for Chronic Pain." *Journal of Safety Research.* Vol. 57. (2016): 83-84.

Debra Houry, MD, MPH is the Director of the National Center for Injury Prevention and Control and Grant Baldwin, PhD, MPH is the Director of the Division of Unintentional Injury Prevention at the CDC National Center for Injury Prevention and Control. This short article is authored by those affiliated with the CDC and they write that the "guideline is not a panacea for the opioid problem or the pain problem, but it is an important step toward more cautious prescribing of opioids." They also note that the authors of the CDC Guideline write that prevention efforts should impact the opioid epidemic without negatively affecting the chronic pain patient. Other than these points, the article is just a summary of the Guideline.

Kermen, Rachel. "Disease-a-Month: Botulinum Toxin for Chronic Pain Conditions." Vol. 62. Year Book Publishers. (2016).

Rachel Kermen is a physician board certified in physical medicine and rehabilitation. She treats spine and musculoskeletal pain in the North Shore University Health System. Botox-A has only been approved by the FDA for one primary pain disorder, chronic migraine. Botox temporarily blocks acetylcholine from being released at the neuromuscular junction. The article explored speculations that Botox could have analgesic properties by inhibition of local neuropeptides or that Botox could be beneficial for intra-articular and arthritic joint pain. The mechanisms for Botox treating chronic pain need more study and results are mixed, but it could be useful in the wide arsenal of treating chronic pain.

Lankhorst, Michael A. "Smoking and Chronic Pain." *Journal of Pain & Palliative Care Pharmacotherapy.* (2016).

Michael A. Lankhorst is a physician with a primary specialty in pain medicine and an additional specialty in anesthesiology at the Nebraska Medicine Clinics. This article is a Q & A-style discussion on smoking's effects on chronic pain. It states that those who smoke are more likely to develop low back or other types of chronic pain and report higher pain levels. As it is suggested that there is a 45% higher rate of smoking in people with depression, it is important to note that those who smoke are more likely to have depression and those with depression are more likely to have chronic pain. The connection of smoking to both depression and chronic pain helps to expose the need for a biopsychosocial approach to chronic pain management.

Lehti, Arja, et al. "Walking Down 'Via Dolorosa' from Primary Health Care to the Specialty Pain Clinic–Patient and Professional Perceptions of Inequity in Rehabilitation of Chronic Pain." *Scandinavian Journal of Caring Sciences.* Blackwell Publishing. (2016).

Dr. Arja Lehti is from the Division for Professional Development in the Department of Clinical Sciences at Umea University in Umea, Sweden. Because many times the symptoms of chronic pain happen without any physical pathology, chronic pain patients can be subjected to

stigmatization, marginalization, and distrust. In order for rehabilitation to take place, patients need respect, confirmation, and support. Also, several studies have shown that comprehensive pain treatment is more effective than other treatments. In this study, the professional perceptions of chronic pain patients specifically in relation to equity and gender were analyzed. Patients' ways of suffering, pain, and rehabilitation were influenced by gender, sociocultural context, and the perceptions of professionals and patients. Further, the view of the "other" and subordination increase the risks for stereotyping and misdiagnosing. The article states, "It is crucial that professionals increase awareness of their own gendered and biased preconceptions and norms through dialogue with colleagues as they struggle to offer equal health care and rehabilitation to chronic pain patients."

Longo, Dan L., Nora D. Volkow, and A.T. McLellan. "Opioid Abuse in Chronic Pain – Misconceptions and Mitigation Strategies." *The New England Journal of Medicine*. Vol. 374, No. 13. (2016): 1253-1263.

Dr. Dan L. Longo is a deputy editor of *The New England Journal of Medicine* and works in non-malignant hematology. Dr. Nora D. Volkow is a psychiatrist who is also the Director of the National Institute on Drug Abuse (NIDA) at the National Institutes of Health. Finally, A. Thomas McLellan, Ph.D. is the Founder and Board Chair of the Treatment Research Institute, board member of Indivior, and also a substance abuse researcher. Non-cancer chronic pain is recognized as one of the most widespread conditions. Over 30% of Americans have a form of acute or chronic pain. This review article discusses why opioid medications are diverted and abused, what opioid-induced tolerance and physical dependence are, and several mitigation strategies to help combat the epidemic of opioid diversion and misuse. Some important things noted in this article include a discussion of the mechanism in which opioids relieve pain (and cause other rewarding effects), a misunderstanding of some physicians as to the difference between physical dependence and addiction, that addiction isn't a predictable result of prescribing opioids, and that "…no single or simple change in prescribing behavior can be expected to alleviate all risks while properly managing pain." Three recommendations made in the article are to increase use of science-supported prescribing and management practices, increase medical school training on pain and addiction, and to increase the amount of pain research.

Nikulina, Valentina, Honoria Guarino, et al. "Patient vs. Provider Reports of Aberrant Medication-taking Behavior among Opioid-treated Patients with Chronic Pain Who Report Misusing Opioid Medication." *Pain*. Vol. 157.8. (2016): 1791-798.

In this research paper, Dr. Valentina Nikulina, an Assistant Professor of Psychology at Queens College, and colleagues, studied how much concordance and overlap there was between provider and patient reports of aberrant medication-taking behavior (AMTB). Some of these behaviors include addiction, pseudoaddiction, self-medication, or for-profit diversion, and the reported rates for these behaviors range from 20 to 75 percent. One of the main suggestions to monitor this behavior is drug screening, but it can't detect all of them, so current findings suggest that in order to maintain the best adherence would be one that uses information from multiple

sources—a triangulation between patient, provider, and toxicology monitoring. There is also an evident need for more physician training in detecting these behaviors, as they identified AMTB in 36% of patients in the study, while 84% was identified by patient self-report.

Outcalt, SD, Nicolaidis C, et al. "A Qualitative Examination of Pain Centrality Among Veterans of Iraq and Afghanistan Conflicts." *Pain Med.* (2016).

Samantha D. Outcalt, PhD, is an Associate Professor of Clinical Psychology in Clinical Psychiatry at Indiana University. The article defines pain centrality as the degree to which a patient views chronic pain as integral to their life or identity. Three emergent themes from the research were control, acceptance, and preoccupation. Also, five characteristics that distinguished patients' changes in centrality from the baseline were biopsychosocial viewpoints, activity level, pain communication, participation in managing their own pain, and social support. Dr. Outcalt says that the centrality of pain should be considered with analyzing the overall chronic pain patient experience.

Rolfe, Paul M., "Paediatric Chronic Pain." *Anaesthesia and Intensive Care Medicine.* Vol. 17. Medicine Pub. Co., (2016).

Paul M. Rolfe is a Consultant in Paediatric Anaesthesia and Pain Medicine at Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust, UK. In his article, he makes the point that children and teens are in a completely different group than adults when it comes to chronic pain. This group of people is dependent on their families or caregivers, and education and engagement of the whole family unit is a key to successful care. Also, Rolfe makes the point that each treatment case must be considered individually (most effectively in a roundtable discussion).

Ruddere, Lies De, and Kenneth D. Craig. "Understanding Stigma and Chronic Pain." *Pain.* Vol. 157.8. (2016): 1607-610.

In this topical review article, Lies De Ruddere, a Professor in the Department of Experimental Clinical and Health Psychology at Ghent University, and Dr. Kenneth D. Craig, a Clinical Psychologist and Emeritus Professor in the Department of Psychology at the University of British Columbia recognize that having chronic nonmalignant pain makes a person susceptible to stigmatizing reactions. This, in turn, translates into poorer treatment and the prolonging of their pain. More research needs to be conducted in order to fully understand the impact on stigmatized people, which is reported by patients to be decreased self-esteem and dignity (among others). This article agrees with the implementation of a biopsychosocial model to replace the biomedical model that is currently the norm in our society. Another point the authors make is that including multidisciplinary pain management strategies into medical/health school curriculum could improve the treatment and lives of those living with chronic pain. Self-stigma, perceived injustice, and top-down factors (personal beliefs, attitudes, and interpersonal relationships) are also discussed in the psychological viewpoint of these authors.

Schäfer, Gráinne, Kenneth M. Prkachin, Kimberley A. Kaseweter, and Amanda C. De C Williams. "Health Care Providers' Judgments in Chronic Pain." *Pain*. Vol. 157.8. (2016): 1618-625.

Grainne Schafer is affiliated with the Research Department of Clinical, Educational & Health Psychology at the University College London and the Neonatal Unit at Queen Charlotte's and Chelsea Hospital. The additional authors of this article also work within the field of psychology. Trustworthiness is a rapid automatic decision we all make about one another, and it was studied in this research paper in terms of providers and pain patients. Among others, it was found that participants estimated males to have more pain than females, thought females were more likely to exaggerate, there was a higher chance a woman's pain would be attributed to psychological problems, and men's pain was taken more seriously. However, it was found that trustworthiness didn't affect pain estimates. This study highlights the differences between male and female chronic pain patients and their likely experiences when seeking treatment. Everyone should be able to receive unbiased chronic pain care.

Seth, Bharti, and Lorraine de Gray. "Genesis of Chronic Pain." *Anaesthesia and Intensive Care Medicine*. Vol. 17. Medicine Pub. Co. (2016).

Dr. Bharti Seth is a Consultant in Anaesthesia and Pain Medicine at The Queen Elizabeth Hospital NHS Foundation Trust, and Dr. Lorraine de Gray is also a Consultant in Anaesthesia and Pain Medicine at The Queen Elizabeth Hospital NHS Foundation Trust. The beginning of the article walks through the scientific history of pain theories ranging from Rene Descartes and a singular pain pathway to the brain to Melzack's Neuromatrix Model of Pain. Several biological and psychosocial factors are identified as leading to pain. Biological examples include gender and genetics, and psychosocial examples include mental health, sexual or physical abuse, culture, and alcohol and drug misuse. It is stated that there is the most evidence that depression happens as a consequence of chronic pain and not the other way around.

St. Marie B. "Primary care experiences of people who live with chronic pain and receive opioids to manage pain: A qualitative methodology." *Journal of the American Association of Nurse Practitioners*. Vol. 28.8. (2016): 429-35.

Barbara St. Marie, PhD, ANP, GNP, ACHPN is part of the Associate Faculty at the College of Nursing at The University of Iowa. Some of the data Dr. St. Marie cites are that 116 million Americans live with chronic pain, chronic pain costs 560-635 billion dollars annually, close to 25 million people live with substance use disorder (SUD) which costs over 467 billion dollars annually, and nearly two million people are affected by prescription opioid abuse or dependence. Chronic pain impacts the biological, psychological, and social aspects of peoples' lives and opioid therapy is foundational, but there isn't enough data to support the long-term efficacy of opioids. The two questions the study sought to answer were "What are the experiences of individuals who live with chronic pain and receive opioid pain medications to manage their pain in primary care?" and "What have been their healthcare experiences as they strive to manage their pain?" With open communication and a caring healthcare team helped patients take better

care of themselves. An interesting fact was that participants noted that the media coverage of people overdosing was why healthcare providers were "cracking down" on prescribing opioids for chronic pain. The study says that it is important to provide more education to healthcare providers on how to manage chronic pain, patients need to be truthful with their healthcare providers, and social policy needs to change in terms of reimbursement of comprehensive pain treatment programs.

Sullivan, Mark D., and Jane C. Ballantyne. "Must we Reduce Pain Intensity to Treat Chronic Pain?" *Pain (Amsterdam). Vol. 157.* (2015).

Mark D. Sullivan and Jane C. Ballantyne are from the Departments of Psychiatry and Behavioral Sciences and Anesthesiology and Pain Medicine, respectively, at the University of Washington. In their topical review, they argue that by focusing on pain intensity, it establishes the wrong care goal, chooses the wrong patients for the strongest analgesics, and decreases understanding of chronic pain. They also say that over time, pain links with emotional and psychological factors more than with nociceptive ones. Chronic pain often causes disability and suffering, and disability and suffering often cause chronic pain. It is argued in this paper that improving quality of life is the duty to medical professionals—not reducing pain intensity. It is recognized that many treatments for chronic pain address the suffering and disability aspects more than they do the pain intensity aspect.

Tabor, Abby, et al. "Perceptual Inference in Chronic Pain." *The Clinical Journal of Pain.* Vol. 32. Raven Press. (2016).

Abby Tabor, PhD is from the Sansom Institute for Health Research at the University of South Australia. It was asked in this research if chronic pain patients have different spatial perceptions than those without, mirroring the Economy of Action hypothesis. There wasn't a significant perceptual difference found. But, "top-down" effects could still influence perception in those with chronic pain. These effects alter processing of "bottom-up" information. This study also highlights how protective behavior is adaptive in acute pain but maladaptive in chronic pain.

Turner, Judith A., Susan M. Shortreed, and Kathleen W. Saunders. "Does Association of Opioid Use with Pain and Function Differ with Fibromyalgia or Widespread Pain Status?" *Pain.* Vol. 157.10. (2016): 2208-216.

Judith A. Turner is from the Department of Psychiatry and Behavioral Sciences at the University of Washington; Susan M. Shortreed is from the Group Health Research Institute in Seattle, WA, and the Department of Biostatistics as well. Kathleen W. Saunders is also from the Group Health Research Institute. The hypothesis tested in this paper was if the difference in 12-month outcomes for those with opioid use versus minimal/no opioid use would be greater for patients with fibromyalgia than for patients without it. Many experts say chronic opioid therapy (COT) is inappropriate, while often those receiving this treatment say it is helpful. A problem is that there is a lack of concrete and sufficient evidence that COT is effective. While it was found that patients who continue with COT are more likely to have worse pain outcomes compared to those

who aren't treated with COT, these worse outcomes with opioids for fibromyalgia patients wasn't confirmed. It was also found that fibromyalgia patients were more likely to discontinue opioids because of side effects than because of pain improvement. This paper only looks at the effect of long-term opioid therapy for a specific condition, fibromyalgia.

Walk, David, M.D., and Michelle Poliak-Tunis, M.D. "Chronic Pain Management: An Overview of Taxonomy, Conditions Commonly Encountered, and Assessment." ***Medical Clinics of North America.*** **Vol. 100.1. (2016): 1-16.**

David Walk, MD, is associated with the Department of Neurology at the University of Minnesota and Michelle Poliak-Tunis, MD, is from the Department of Orthopedics and Rehabilitation at the University of Wisconsin School of Medicine and Public Health. This article gives an overview of chronic pain, its background, mechanisms, and how it should be assessed. Chronic pain's existence as a disease state is a major way in which it is separate from acute pain, and this is supported by clinical and preclinical evidence. The specific ways in which chronic pain is discussed as unique from acute pain are through the mechanisms of peripheral and central sensitization, changes in descending modulation, and deafferentation. Different types and features of pain are also discussed with an emphasis on the importance of characterizing the pain by mechanism, organ system, and syndrome when possible. In their discussion on pain assessment, setting realistic expectations and goals, the use of pain questionnaires and tools to assist in judging risks and benefits of opioid therapy, and assessing psychological factors all have importance.

Webster, Lynn R. "Chronic Pain and the Opioid Conundrum." ***Anesthesiology Clinics*****. Vol. 34.2. (2016): 341-55.**

Dr. Lynn Webster is board-certified in anesthesiology and pain medicine, certified in addiction medicine, the Vice President of Scientific Affairs of PRA Health Sciences, the immediate past president of the American Academy of Pain Medicine, and in charge of the Lifetree Pain Clinic in Salt Lake City, Utah. In this paper, he addresses the stigmatization of chronic pain patients, a climate of fear among prescribers of opioids, the lack of third-party payers to cover interdisciplinary care programs, and the need for comprehensive pain care. An important statistic mentioned in this paper is that of the 16,235 opioid-related deaths in 2013, 6,973 involved benzodiazepines, and most involved multiple substances—not just an opioid. There is some data to suggest that some patients do well with long-term opioid use, but there are other studies that say there is insufficient evidence. Dr. Webster also notes that there is a 50% overlap of pain and psychiatric disorders and a 60% overlap between psychiatric and addiction disorders. This supports the evidence for many chronic pain patients having a psychiatric comorbidity.

Williams, Amanda C. De C. "Defeating the Stigma of Chronic Pain." ***Pain.*** **Vol. 157.8. (2016): 1581-582.**

In this commentary on the Ruddere and Craig article (earlier in this bibliography) by Amanda C. De C. Williams, a clinical psychologist at the University College London and the Pain

Management Centre at the National Hospital for Neurology & Neurosurgery, University College London Hospitals, she stresses the need to implement an integrated biopsychosocial model of treatment in the pain community. She highlights how the stigma of chronic pain patients is associated with underassessment, underestimation of pain by staff, discounting of patient self-report, disbelief of the extent of pain, and undertreatment. As a direct effect on the chronic pain patient, stigma is also involved with amplifying social withdrawal, undermining attempts to manage pain, and a decrease of self-esteem. The author states that even with all the studies of stigma in practice, there are few that attempt to change the behaviors of health care staff.

Williams, Amanda C., and Kenneth D. Craig. "Updating the Definition of Pain." *Pain.* Vol. 157.11. (2016): 2420-423.

This topical review is written by Amanda C. Williams, the author of the above commentary, and Kenneth D. Craig, a Clinical Psychologist and Emeritus Professor in the Department of Psychology at the University of British Columbia (and also previously mentioned in this bibliography). They point out that the current technical definition of pain, as synthesized by the International Association for the Study of Pain and not updated since 1979, neglects to include the many advances made in the understanding and treatment of the disease of chronic pain. Their proposed new definition is that "Pain is a distressing experience associated with actual or potential tissue damage with sensory, emotional, cognitive, and social components." The three reasons they gave for the need to update the definition were that "acknowledging only sensory and emotional features [of pain] excludes major and clinically important characteristics," "characterizing the experience simply as 'unpleasant' falls short" and "potentially trivializes severe pain," and that "subjectivity and self-report are prioritized at the expense of nonverbal behaviors." By including cognitive and social aspects into the definition, it makes it more balanced and comprehensive.

Zorina-Lichtenwalter, Katerina, et al. "Genetic Predictors of Human Chronic Pain Conditions." *Neuroscience.* Vol. 338. (2016).

Katerina Zorina-Lichtenwalter is from the Alan Edwards Centre for Research on Pain at McGill University. This review article is a more in-depth analysis of the genetic factors of human chronic pain. Several specific genetic mutations are identified to the specific pain condition they lead to, and chronic pain is established to have a somewhat wide reported heritability of 16%-50%. Also, rather than following the typical Mendelian transmission model, chronic pain is made up of aggregates of endophenotypes (symptoms of chronic pain conditions like sleep disturbance, depression, and hypersensitivity to external stimuli). Among several specific genetic mutations mentioned are *de novo* mutations in sodium channels, which are blamed for post-trauma pain perception, a frameshift mutation in the KCNK18 gene, which is responsible for familial migraine with aura, and single nucleotide polymorphisms that are common, have little phenotypic effect, but modulate susceptibility to chronic pain. Further explored through a genetic study are migraines, with a causality of either vascular dysregulation or neuronal hyperexcitability, and musculoskeletal conditions (temporomandibular disorder, low back pain, and fibromyalgia). In this review, there is also a large table that provides a list of genes reported in genetic association

studies of chronic pain conditions. In the end it is noted that all chronic pain conditions show an enrichment of genes involved in neurotransmission.

Opioid Epidemic

Adams, Jerome, Gregory H. Bledsoe, and John H. Armstrong. "Are Pain Management Questions in Patient Satisfaction Surveys Driving the Opioid Epidemic?" *American Journal of Public Health*, Vol. 106, No. 6. (2016): 985-986.

Jerome Adams is from the State of Indiana Department of Health, Gregory H. Bledsoe is from the State of Arkansas Office of the Surgeon General, and John H. Armstrong is from the State of Florida Department of Health. In their editorial in the *American Journal of Public Health*, the authors argue that the public must be educated about the dangers of opioids, prescribers must be taught about opioid alternatives for pain management, there is a need for optimized prescription drug monitoring programs (PDMPs), and that there should be increased availability of substance use disorder management. They also say that up to 80% of heroin users started with diverting prescription drugs and that the U.S. Surgeon General has said that overprescribing by physicians is a causal link in this addiction chain. Finally, they state that "pain as the fifth vital sign" that was promoted by the Joint Commission and Agency for Healthcare Research and Quality is responsible for the misconception that patients should experience no pain. The article never states that there are potential individual cases where prescription opioids are needed and beneficial to a chronic pain patient.

Bass, Pat F, III, MD, M.S., M.P.H. "Opioids A Pediatric Epidemic." *Contemporary Pediatrics*. Vol. 33, No. 9. (2016): 10-11, 14-16.

Dr. Pat F. Bass III is Associate Professor of Medicine and Pediatrics along with Chief Medical Information Officer at Louisiana State University Health Sciences Center-Shreveport. This article emphasizes that opioids are also a problem in the pediatric community, that pediatricians could be prescribing too many opioids, and identifies risk factors for pediatric opioid misuse. In 2014, Dr. Bass writes there were more than 460,000 adolescent opioid users and 168,000 of them had an addiction. Other statistics stated were that between 40% and 90% of adolescent opioid abusers will move to heroin use, and that a study of an academic pediatric oncology practice found a 11.7% rate of opioid misuse. There is an obvious opioid issue in this community, especially because opioid naïve patients could have a greater risk of complications. Among things adding to the issue are viewpoints that opioids are harmless, that prescription opioids are safer than heroin, the rising cost of opioids and decreasing cost of heroin, and the misconception that opioid problems are limited to lower class society. Dr. Bass identifies risk factors that include genetics (40%-60% of addiction), stress, exposure to drug use, depression, anxiety, access, permissive attitudes towards opioids, and a history of sexual victimization. He states that there is emerging evidence that shows a very small exposure to opioids can lead to future problems for the patient. One quote is that "…it is essential to limit the access of prescription opioids by children and adolescents who would abuse them while still providing adequate pain

management to those who need it." The article never explicitly states that sometimes an opioid is appropriate for an individual.

Beauchamp, Gillian A., et al. "Moving Beyond Misuse and Diversion: The Urgent Need to Consider the Role of Iatrogenic Addiction in the Current Opioid Epidemic." *American Journal of Public Health*. Vol. 104, No. 11. (2014): 2023-9.

Gillian A. Beauchamp, MD, is a Toxicology Fellow at Oregon Health & Science University. In this commentary, she calls for programs and policies to limit the misuse and diversion of opioids. She also says that calls to consider the risk of iatrogenic addiction in treatment of pain have been muted, and more longitudinal research needs to be done to guide clinicians in balancing the need for opioids with their risk of adverse effects. The fact that 46 Americans per day died of prescription opioid overdose in 2010 was paralleled by increases in opioid sales between 1999-2010. Her main question posed was what the role of inadvertent iatrogenic addiction was as opposed to the role of intentional misuse and diversion. She suggests that a higher rate of iatrogenic addiction is present than is realized. Iatrogenic addiction is an addiction that has been caused by a medical treatment, which in this case is an opioid prescription. The final conclusion summed up that "…the mission to treat pain must be balanced to at least some degree by a mission to prevent opioid abuse and addiction."

Beaucham, G.A. "The Toxicologist as Educator: Addressing Pain Management in the Midst of an Opioid Epidemic." *J. Med. Toxicol.* Vol.11, No. 279. (2015).

Gillian A. Beauchamp, MD, is also the main author in the previous commentary in this bibliography. Here, she writes an editorial in the *American College of Medical Toxicology*. The editorial is about how toxicologists are a valuable tool for medical educators in redesigning medical curricula and to fill the gap in pain management education that currently plagues most medical schools. Dr. Beauchamp says that the toxicology rotation serves as an ideal place to educate on how to manage pain while watching for diversion, adverse effects, polypharmacy, and iatrogenic addiction. A pneumonic device serves as a reference for trainees, called "RIPE." It stands for review, interview, prescribe appropriately, and education.

Burke, D.S. "Science (New York, N.Y.): Forecasting the Opioid Epidemic." Vol. 354. *American Association for the Advancement of Science*. (2016).

Donald S. Burke is the Dean of the Graduate School of Public Health at the University of Pittsburgh in Pittsburgh, Pennsylvania. In his editorial, he states that since the year 2000, nearly 500,000 people have died from drug overdoses largely driven by opioid addiction and its lead in to heroin use. He advocates for the use of computational models to view this epidemic as a public health issue. It would involve treating the opioid epidemic as a dynamic system with networks of many interacting people (nonusers, users, prescribers, law enforcement, illicit suppliers, etc.). With these models, the policymakers would have a tool and data to estimate the effectiveness of specific interventions. Some statements he writes are that "We can't arrest our way out of the epidemic" and "…a new, public health-oriented approach is needed."

DiJulio, Bianca, Jamie Firth, Liz Hamel, and Mollyann Brodie. "Kaiser Health Tracking Poll: November 2015 Findings." ***The Henry J. Kaiser Family Foundation*****. (2015).**

Bianca DiJulio is an Associate Director for the Public Opinion and Survey Research Program at the Henry J. Kaiser Family Foundation. Jamie Firth was a Survey Analyst for the Public Opinion and Survey Research team at the Kaiser Family Foundation, and Mollyann Brodie is the Executive Director of Public Opinion and Survey Research at the Foundation. This survey explores the public's connection to and knowledge of the issue of prescription painkiller abuse and how to address it. All of it refers to percentages of people in response to different questions or prompts. A summary of important findings were: 56% of the public have a connection to the issue of painkiller abuse, 39% know someone who has been addicted to prescription painkillers, 2% were addicted themselves, 25% have a close friend or family member addicted, 16% know someone who has died from a prescription painkiller overdose, and whites more than blacks or hispanics are likely to have a personal connection. Also, only 40% of the public was aware that drug overdose is the leading cause of accidental deaths in the United States, 62% think naloxone access should only be allowed with a prescription and 33% think it should be available without a prescription. Finally, 39% of the public thinks it is hard for people who need them to get prescription painkillers.

Dineen, Kelly K., and James M. DuBois. "Between a Rock and a Hard Place." ***American Journal of Law & Medicine*****. Vol. 42, No. 1. (2016): 7-52.**

Dr. Kelly Dineen is Assistant Professor in both the School of Law and Center for Health Care Ethics at Saint Louis University, and she is also the Assistant Director of the Center for Health Care Ethics and Co-Director of the Bander Center for Medical Business Ethics. Dr. James DuBois is the director of the Center for Clinical Research Ethics and the Steven J. Bander Professor of Medical Ethics and Professionalism at the Washington University in Saint Louis School of Medicine. In their article, they call for the development of an evidence base in prescription opioids for the treatment of pain and a new model of misprescribers. They recognize that the inability to access opioids in correct circumstances is a cause of suffering and less effective pain care, more misprescribing data is needed to provide a comprehensive picture of the problem, regulation of controlled substance prescriptions exists in a volatile zone between medicine and law enforcement, and that context is extremely important in determining between normal practice and a criminal act. The authors state that contrary to popular perception, research doesn't show any correlation between pain specialization and legal sanction for misprescribing. The Drug Enforcement Agency (DEA) needs to make sure to act within their power as law enforcement overreach can cause destruction of the personal and professional lives of wrongfully charged physicians and exacerbate the "chilling effect," which harms chronic pain patients. The 4D model of misprescribing is still used by policymakers even though it is over 30 years old. The four "Ds" for prescribers abusing their privilege stand for dated, duped, dishonest, or disabled. The better proposed model is the 3C model, which only focuses on physician traits. It stands for careless, corrupt, and compromised, which "…consistently focuses on the behavior of physicians…" and "…better matches behaviors with culpability…"

Franklin, Gary, et al. "A Comprehensive Approach to Address the Prescription Opioid Epidemic in Washington State: Milestones and Lessons Learned." ***American Journal of Public Health*****. Vol. 105, No. 3. (2015): 463-469.**

Dr. Gary Franklin is from the Department of Environmental and Occupational Health Sciences at the University of Washington School of Public Health. In this article, Dr. Franklin and others argue that the solution to the opioid epidemic will come from state action. As the main part of the problem, a 500% increase in opioid prescribing between 1997 and 2006, and a stated "…overprescribing of opioids for many common chronic pain conditions for which evidence does not support their use" are noted by the article. The authors then provide examples of what Washington State did in order to combat the opioid epidemic. Some of these examples include the implementation of a prescription drug monitoring program, telemedicine technology for pain consults by a multidisciplinary pain expert group, a prescription drug take-back program, a Samaritan law related to naloxone use for substance overdose, and increased collaboration among state agencies. With all of the many things Washington State has done, they saw a decrease in prescription opioid overdose deaths by 27% from 2008 to 2012.

Kanouse, Andrew B. & Compton, Peggy. "The Epidemic of Prescription Opioid Abuse, the Subsequent Rising Prevalence of Heroin Use, and the Federal Response." ***Journal of Pain & Palliative Care Pharmacotherapy*****. Vol. 29, No. 2. (2015): 102-114.**

Andrew Kanouse, BS, is a 2014 graduate of Georgetown University and Peggy Compton, RN, PhD, is Professor and Associate Dean for Academic Affairs at the School of Nursing & Health Studies at Georgetown University. Their article serves as a historical overview of prescription opioid abuse, consequences of toxicity and potential transition to heroin use. Some of the events in the timeline include a 1980 *New England Journal of Medicine* letter that refers to the occurrence of addiction in 4/12,000 opioid-treated patients, the American Pain Society advocating for pain as a fifth vital sign in 1995, the Joint Commission of Accreditation of Healthcare Organizations asserting that pain management is a fundamental patient right in 2000, an article published in the *Pain Physician Journal* saying that as 4% of the world population, the U.S. uses 80% of the prescription opioids, and that the amount of opioid prescriptions increased from 76 million in 1991 to nearly 207 million in 2013 because of social mandates—all pain should be treated. Efforts to combat the opioid epidemic are then discussed, referring to increasing drug tracking/monitoring, appropriate disposal methods, electronic interstate drug monitoring, standardized screening/prescribing, and treatment and support for current abusers. An explicit statement from the article reads, "Effective use of opioids to treat chronic nonmalignant pain is not possible if the patient suffers an untreated substance abuse disorder."

Kennedy-Hendricks, Alene, et al. "Drug and Alcohol Dependence: Primary Care Physicians' Perspectives on the Prescription Opioid Epidemic." *Elsevier*. Vol. 165. (2016).

Alene Kennedy-Hendricks is from the Department of Health Policy and Management at the Johns Hopkins Bloomberg School of Public Health. In this study, the authors wanted to find out how primary care physicians (PCPs) viewed the aspects of the opioid epidemic, because PCPs make up the biggest volume of opioid prescriptions. Greater than 50% of PCPs, in a 2014 survey, viewed prescription drug abuse as a major problem. A survey was conducted July 11-22, 2014 to fill in some of the gaps of previous research of PCPs' attitudes. Some of these results were that 85% thought opioids were effective in managing acute noncancer pain, while only 56% thought they were effective options for chronic noncancer pain. Only 62% of PCPs felt comfortable in screening patients for substance use disorders, 66% viewed those with opioid use disorder as more dangerous than the general population, 91% favored requiring medical schools and residency programs to train students on addiction detection and treatment, and 90% supported requirements on teaching chronic pain treatment. The authors also state that there is a lack of evidence of benefit from long-term opioid treatment for chronic pain, and provider stigma could result in a lower quality of care, poorer outcomes, and reduced connection to treatment services. It is helpful to get a view into the perspectives of this group of primary care physicians.

Kissin, Igor. "Opioid Prescriptions for Pain and Epidemic of Overdose Death: Can the Dramatic Reduction in Anesthesia Mortality Serve as an Example?" *Journal of Pain Research*. Vol. 9. (2016): 453-456. *PMC.*

Igor Kissin is from the Department of Anesthesiology, Perioperative and Pain Medicine at the Brigham and Women's Hospital—affiliate of Harvard Medical School. He suggests that by implementing a similar multifactorial context to opioids, as anesthesia, it will reduce the number of opioid overdose deaths. It is also noted that the annual opioid death toll is not purely based on opioids, as the majority of cases are found with other central nervous system depressants. Kissin also states, along with several other authors in this bibliography, that there is currently no evidence to show that long-term opioid therapy is effective for chronic pain, and opioid use disorders are common in chronic pain patients. Three factors that resulted in the dramatic decrease in the amount of anesthesia deaths that could be transferred to opioids are a focus on the mechanisms of high mortality that can be modified the easiest, establishment of apprenticeships for providers, and the broadening of the use of specific monitoring techniques. The first step the author suggests is to reduce the amount of new chronic pain patients that are maintained on long-term opioids.

Meldrum, Marcia L. "The Ongoing Opioid Prescription Epidemic: Historical Context." *American Journal of Public Health*. Vol. 106, No. 8. (2016): 1365-1366.

Marcia L. Meldrum is part of the Center for Social Medicine and the Humanities at the Semel Institute for Neuroscience and Human Behavior at the University of California—Los Angeles. In

this editorial, the author writes about some of the background of the opioid epidemic and some current thoughts about pain treatment. In the 1970s, chronic pain was very much undertreated because of "the special emotional significance [of opioids] that interferes with their rational use." Kathleen Foley and Russell Portenoy pointed out that there weren't any long-term data published that showed evidence of high addiction rates among pain patients. The author acknowledges that the best alternative to opioids is a multidisciplinary team approach and integrative pain strategy, but fewer than 200,000 patients currently participate in such programs. She also states that patients with severe chronic pain will still need opioids and physicians will need to prescribe them.

Nelson, L.S., Juurlink, D.N., Perrone, J. "Addressing the Opioid Epidemic." ***JAMA.*** **Vol. 314, No. 14. (2015): 1453-1454.**

Lewis S. Nelson, MD, is an Adjunct Professor at the Ronald O. Perelman Department of Emergency Medicine at NYU Langone Medical Center, David N. Juurlink, MD, PhD, is a Scientist at the Sunnybrook Health Sciences Centre, and Jeanmarie Perrone, MD, is a Professor of Emergency Medicine at the Hospital of the University of Pennsylvania and Director of the Division of Medical Toxicology. In this editorial in *JAMA*, the authors are critical of the use of opioids and say that there is little evidence for the long-term benefit of opioid therapy for most types of chronic pain. Within good medical care, they want to reduce the prevalence of opioid use disorders by reducing the incidence of patients using them for the first time, as they state 10% of patients who start opioid treatment will move to chronic use (more than three months). They state, "The lifelong implications of this disease far outweigh the limited benefits of opioids in the treatment of chronic pain, and in many cases the risks inherent in the treatment of acute pain with opioids." The authors also state that they want to "…keep opioid naïve patients opioid naïve."

Poon, Sabrina J., and Margaret B. Greenwood-Ericksen. "The Opioid Prescription Epidemic and the Role of Emergency Medicine." ***Annals of Emergency Medicine.*** **Vol. 64. (2014).**

The authors are from the Harvard Affiliated Emergency Medicine Residency at Brigham and Women's Hospital and Massachusetts General Hospital in Boston, MA. Pain is the most common reason for patients to be in the emergency room, and the prescription drug epidemic has been unintentionally driven by an emphasis on improving pain management. In 2010, 60% of drug overdose deaths were from prescription drugs, and 75% of those prescription drugs were opioids. Every year, 6.8 to over 12 million Americans get prescription drugs non-medically. One of the reasons for increased opioid prescriptions coming from the emergency department is that emergency providers are finding their pay is increased according to patient satisfaction and timely pain control. There is a wide variety of prescription practices among emergency physicians. A fully functional and standardized prescription drug monitoring program (PDMP) would be useful in addressing opioid diversion, but barriers like being a burden on a physician's time and difficulty accessing and navigating the system make PDMPs less effective. Another issue the authors noted is that medical students and physicians in continuing education classes

need to have training and education on how to effectively manage pain. They call for state and federal governments to provide funding and incentives to optimize PDMPs for emergency departments and to integrate them between states.

Skolnick, Phil, and Nora D. Volkow. "Re-Energizing the Development of Pain Therapeutics in Light of the Opioid Epidemic." ***Neuron (Cambridge, Mass.).*** **Vol. 92. Cell Press. (2016).**

Phil Skolnick is from the Division of Therapeutics and Medical Consequences at the National Institute on Drug Abuse at the National Institutes of Health. Nora D. Volkow is from the Office of the Director at the same organization. In their article, they suggest that it is unrealistic to expect any new novel pain therapeutics as an immediate response to the opioid epidemic. However, they acknowledge that pain is the most prevalent, disabling, and costly health problem in America and cite that 245 million opioid prescriptions were dispensed in 2014, more than 125 million American adults suffer from acute or chronic pain, there were 19,000 overdose deaths in 2014, 750,000 emergency department visits related to opiates, and that the number of infants born with neonatal abstinence syndrome has increased three-fold between 2000 and 2009. They note that pain programs have been affected by the reduction of investments by the pharmaceutical sector in neuroscience research and development, and the most immediate response has been to reformulate already approved opioids with abuse deterrent features.

Wilkerson, Richard Gentry, MD, Hong K. Kim, MD, MPH, et al. "The Opioid Epidemic in the United States." ***Emergency Medicine Clinics of North America*****. Vol. 34, No. 2. (2016): 1-23.**

Richard Gentry Wilkerson, MD, is an Assistant Professor of Medicine and board certified in emergency medicine at the University of Maryland School of Medicine. In the article, the focus is on the history and background of opioid medications, and several responses to the opioid epidemic, including more widespread use of naloxone and prescription drug monitoring programs. Some data cited in this study are that according to the World Health Organization, 22% of patients at primary clinics have chronic pain, deaths from drug overdose surpassed motor vehicle collision mortality in 2009, 4,903 of the 16,651 overdose deaths in 2010 were solely because of opioids, and chronic nonmedical use is twice as high in men as it is in women. This use is also higher in the white population than in the black or hispanic populations. More data is needed to fully understand the issue, because much of the research now is like a patchwork from many different sources, i.e. self-reporting, criminal databases, poison control center data, and autopsy or death certificate results. Another issue presented in the article is how the pressure put on prescribers to alleviate pain has added to the vast number of opioid prescriptions. "The efforts to reign in the abuse of opioids will require further research and a reexamination of the balance between the need to treat pain and the recognition that opioid medications are not without risk."

Von Korff, Michael R., and Franklin, Gary. "Responding to America's Iatrogenic Epidemic of Prescription Opioid Addiction and Overdose." *Medical Care.* Vol. 54. (2016).

Michael R. Von Korff, ScD is from the Group Health Research Institute, and Gary Franklin, MD, MPH is from the Departments of Environmental and Occupational Health Sciences, Neurology, and Health Services at the University of Washington and Washington State Department of Labor and Industries. In their editorial, they say that among the 9 to 11 million Americans using long-term prescription opioids, 10-40 percent may have opioid use disorder. They say that lowering the recommended opioid dose below 100 MME (morphine equivalent) wouldn't affect many patients and would reduce the chance of opioid use disorders for at-risk patients. There are six immediate actions proposed: 1) Avoid ill-advised and unplanned initiation of chronic opioid therapy, 2) Change policies and regulations, 3) Enhance population surveillance of opioid prescribing and safety, 4) Ramp up clinical monitoring, 5) Consistently offer tapering off opioids as an option, 6) Ensure treatment options for addicted patients being treated with chronic opioid therapy.

Behavioral Health

Campbell, Gabrielle, et al. "Prevalence and Correlates of Suicidal Thoughts and Suicide Attempts in People Prescribed Pharmaceutical Opioids for Chronic Pain." *The Clinical Journal of Pain*. Vol. 32. Raven Press. (2016).

Gabrielle Campbell, MCrim, is from the Australian National Drug and Alcohol Research Centre. In this original article, it is discussed how those living with chronic pain are at nearly a double risk for suicide, and it is stated that 2/3 of those who had attempted suicide had some history of chronic pain. Some of the risk factors for suicidal behavior were being female, having a previous suicide attempt, substance use, access to weapons, childhood abuse, and feelings of isolation and hopelessness. Other pain-specific risk factors included pain severity, the length of pain, access to analgesics, and pain catastrophizing. An interesting statistic from this study is that the use of nonopioid pills (37%) was preferred over opioids (23%) despite all of the study participants having access to opioid medications. One of the final statements of this article also highlights the need of a biopsychosocial approach to treating chronic pain saying, "People living with chronic pain have complex clinical profiles, having not only pain, but also mental health problems, sleep problems, low incomes, and low physical functioning."

Hooten, W.M. "Chronic Pain and Mental Health Disorders: Shared Neural Mechanisms, Epidemiology, and Treatment." *Mayo Clinic Proceedings*. Vol. 91, No. 7. (2016): 955-970.

Dr. W. Michael Hooten is a Professor of Anesthesiology at the Mayo Clinic School of Medicine with an interest in evidence-based pain medicine. Both chronic pain and mental health disorders could have shared neural mechanisms. This article describes the pain matrix, a constellation of brain regions that is turned on by nociceptive stimuli. In those with fibromyalgia, temporomandibular joint disorder, chronic spinal pain and chronic abdominal pain, more than

50% had high depressive symptoms or mood disorders. In chronic pain patients, major depressive disorder ranges from 2-61 percent and bipolar disorder from 1-21 percent. Another interesting statistic is that those with anxiety disorders are two times more likely to develop migraines than those without. Opioid use disorder (OUD) has been said to range from 1-23 percent in studies said to have high methodological quality. Suicidal thoughts occur in 28-48 percent of treatment seeking chronic pain patients. As a well-established aspect of comprehensive pain treatment, cognitive behavioral therapy (CBT) has been proven effective by functional imagine research. The ending of this article, after informing of many different statistics relating to chronic pain and mental health, argues that behavioral interventions should be among the first line of treatments used to combat chronic pain.

Tang, Nicole K.Y., et al. "Mental Defeat is Associated with Suicide Intent in Patients with Chronic Pain." *The Clinical Journal of Pain*. Vol. 32. Raven Press. (2016).

Niclole K. Y. Tang, DPhil, is from the Department of Psychology at the University of Warwick, Coventry, United Kingdom. In this article, the association of chronic pain to suicidality is further explored in terms of mental defeat, a state of mind characterized by loss of autonomy, agency, and human integrity. The estimated rate of completed suicide within the chronic pain patient population is 23.3 per 100,000—double that of the general population. The previously cited article by Campbell, et al. lists the following risk factors: being female, having a previous suicide attempt, and presence of depression or other psychiatric conditions. Findings of this study were supportive of the statement that pain-related feelings of defeat might increase one's sense of loss and encourage the sufferers to escape.

Wilson, Keith G., et al. "Testing the Interpersonal Theory of Suicide in Chronic Pain." *The Clinical Journal of Pain*. Raven Press. (2016).

Dr. Keith G. Wilson is an Associate Scientist in Clinical Epidemiology at the Ottawa Hospital Research Institute, Associate Professor in the Department of Medicine and School of Psychology at the University of Ottawa, and a Staff Psychologist at The Ottawa Hospital Rehabilitation Centre. The article states and reflects the general and specific risk factors for suicide in the chronic pain population, but puts its focus on the interpersonal theory. The interpersonal theory of suicide consists of perceived burdensomeness and thwarted belongingness. Perceived burdensomeness is the belief that one has become a source of hardship and thwarted belongingness is an unmet need for social connectedness. An important result of the study was finding that perceived burdensomeness was more highly correlated with the Beck Scale for Suicide Ideation than any other risk factor looked at, and should be considered a clinically relevant and replicable risk factor for suicide ideation in this population. Although some risk factors cannot be changed with improved pain management, hopelessness and perceived burdensomeness could be treated with interventions like interdisciplinary rehabilitation.