

PGAP® News

News and updates from the PGAP, an evidence-based treatment program targeting psychosocial barriers to recovery and rehabilitation for clients suffering from debilitating health or mental health conditions.

News from the Scientific Director

In this Newsletter, we share recent research findings from our Centre. The first article briefly describes the findings of a recent study examining how treatment-related reductions impact on return-to-work outcomes in individuals who have sustained whiplash injuries. The results suggest that reductions in perceptions of injustice increases the probability of successful return to work following whiplash injury. As far as we are aware, the Progressive Goal Attainment program (PGAP) is the only psychosocial intervention designed to target perceptions of injustice associated with debilitating injury.

A second article describes recent research linking catastrophic thinking to physiological markers of pain sensitization. The emerging pattern of findings indicates that catastrophizing is not simply a maladaptive way of thinking about pain, catastrophizing appears to be associated with dysfunction in the central modulation of pain. A study recently conducted in our laboratory in collaboration with Johan Vlaeyen of the University of Leuven suggests that catastrophizing might be a risk factor for the spreading of pain following musculoskeletal injury. We are continuing this line of research in the hope of identifying the mechanisms by which catastrophizing might contribute to widespread pain.

A third article describes our recent research on the contributions of activity-

related pain summation to the severity of disability associated with whiplash injury. A number of studies from our Centre have shown that a certain percentage of individuals experience increased pain as a result of repeated physical activity. In the study described in this Newsletter, we show that a measure of activity-related pain summation is associated with more severe disability. On the basis of these findings we suggest that measures of activity-related summation of pain should be included in assessments of disability in individuals who have sustained musculoskeletal injuries.

If we are able to demonstrate that PGAP-TKA can be effectively delivered by nurses, the findings would broaden the range of health disciplines that make up the PGAP evidence base, and in turn, increase the accessibility to PGAP services.

Our last article in this Newsletter briefly describes a modification of the PGAP which are we currently testing with individuals who have undergone total knee arthroplasty. We are set to initiate recruitment for this study within the next month. The study is being conducted in English and in French in collaboration with the Montreal General Hospital, Hopital Sacre Coeur (Montreal) and the QE II Hospital (Halifax). What is novel about this trial is that improvement in quality of life is the objective if treatment as opposed to return to work. In addition, for the first time, nurses will be used as the PGAP providers. In the past, the PGAP providers used in PGAP trials have included psychologists, social workers, occupational therapists and physical therapists. If we are able to demonstrate that PGAP-TKA can be effectively delivered by nurses, the findings would broaden the range of

health disciplines that make up the PGAP evidence base, and in turn, increase the accessibility to PGAP services. While there have been some nurses whom have attended PGAP training, few are actually in a position of employment that enables them to provide the intervention.

Michael J.L. Sullivan, PhD, Scientific Director

The Relation between Perceived Injustice and Return to Work in Individuals Participating in the PGAP

Recent research has highlighted the role of perceived injustice as a psychosocial risk factor for prolonged disability following musculoskeletal injury^[20]. Perceived injustice has been defined as an appraisal cognition that comprises elements of excessive focus on the magnitude of loss or suffering consequent to injury, the belief that sustained losses are irreparable, and the external attribution of blame for sustained losses^[16].

Research to date suggests that high scores on perceived injustice are associated with heightened pain, emotional distress and disability^[16]. The results of several prospective studies suggest that perceptions of injustice might trigger a cascade of physical and psychological processes that ultimately compromise individuals' recovery potential^[17]. On the basis of research linking perceptions of injustice to adverse recovery outcomes, clinical researchers have called for the development of intervention programs that specifically target perceptions of injustice^[14].

The Progressive Goal Attainment Program (PGAP) is a psychosocial intervention

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that was designed to target pain-related psychosocial risk factors^[18]. In its original form, the PGAP targeted three pain-related psychosocial risk factors, namely catastrophic thinking, fear of movement, and perceived disability. In 2008, the PGAP was modified to include techniques specifically designed to target perceptions of injustice.

On the basis of research suggesting that perceived injustice was a risk factor for prolonged disability, it follows that reductions in perceived injustice should be associated with better rehabilitation outcomes. We tested this prediction recently in a sample of 100 (53 men, 47 women) individuals who had sustained whiplash injuries in rear collision motor vehicle accidents. On average, participants were 16.6 weeks post-injury at the time of enrolment.

Participants completed measures of pain severity (McGill Pain Questionnaire)^[10], catastrophic thinking (Pain Catastrophizing Scale)^[19], fear of movement (Tampa Scale of Kinesiophobia)^[8], self-rated disability (Pain Disability Index)^[22] and perceived injustice (Injustice Experiences Questionnaire)^[16]. The Injustice Experiences Questionnaire (IEQ) was developed at our Centre and in recent years, has emerged as a robust predictor of problematic outcomes following injury. Participants completed these measures at initial screening and at the end of treatment. A condition of enrolment was that clients had to score in the risk range on at least one of these measures at initial screening.

Return-to-work outcomes were assessed at treatment termination. Descriptive analyses revealed that 34% of participants did not return to work, 29% of participants were enrolled in a return to work program, and 36% of participants returned to work. The findings of the study replicated previous work showing that reductions in catastrophizing, fear of movement and self-rated disability are prospectively associated with better return to work outcomes. The study extended previous findings by showing that perceptions of injustice influenced return to work outcomes independent of the variance accounted for by other pain-related psychosocial risk factors.

In previous research, IEQ scores have been shown to be particularly resistant to change. In one study, individuals with musculoskeletal pain participating in a functional restoration program showed a 5% decrease in IEQ scores^[16]. In

another study, participants enrolled in a multidisciplinary pain treatment program showed a 15% reduction in IEQ scores^[14]. It has been suggested that the modest reductions in IEQ scores that have been reported in previous research are not surprising given that previous treatment studies have not included techniques specifically designed to target perceptions of injustice.

On average, participants who completed the PGAP showed a 27% reduction in IEQ scores. Although comparisons with previous research must be made cautiously, the results suggest that the inclusion of techniques such as guided disclosure, validation and emotional problem solving can enhance positive rehabilitation outcomes in individuals with disabling musculoskeletal injuries.

An added advantage of the PGAP is that it is delivered by a single provider as opposed to a multidisciplinary team. The interventionists in this study were either physical therapists or occupational therapists who had followed a two-day PGAP skills training program. The rationale behind the development of the PGAP was that an approach to intervention that was matched to the client's risk profile could yield comparable or even superior outcomes as those generated by untargeted and more costly approaches such as functional restoration programs or multidisciplinary pain treatment programs.

The results of this study were presented at the International Association for the Study of Pain World Congress in Buenos Aires, Argentina in October 2014.

Catastrophizing and the Pathophysiology of Problematic Pain Outcomes: New Findings

Pain catastrophizing is currently considered to be the most robust psychological predictor of problematic pain outcomes. There are currently over 1000 published studies that have been conducted documenting the adverse effects of pain catastrophizing on the health and mental health status of individuals with pain-related conditions^[13, 17].

In early research in this area, 'pain catastrophizing' was conceptualized as a form of

maladaptive coping^[7]. Like other forms of coping, it was thought that, as a function of certain kinds of life experiences, individuals would 'learn' or 'adopt' this approach to coping with pain. Regardless of the short-term benefits that might be derived by reacting 'catastrophically' to pain, the research made it clear that such benefits were short-lived and overall, pain catastrophizing was associated with long-term costs^[21]. The results of numerous studies have shown that the 'costs' of pain catastrophizing include increased emotional distress, increased pain severity, slower recovery from injury or surgery, and prolonged occupational disability^[17].

Over the past 10 years, research has begun to emerge suggesting that pain catastrophizing might be more than just a maladaptive psychological coping strategy. A series of intriguing findings suggest that pain catastrophizing might be closely linked to dysfunction in central pain processing mechanisms^[13]. Brain imaging studies have revealed that individuals who catastrophize about their pain show a pattern of brain activation that differs from that of individuals who do not catastrophize about their pain^[15]. Pain catastrophizing appears to be associated with enhanced activation of brain regions responsible for the emotional and attentional aspects of pain, and a decreased activation of brain regions responsible for the inhibition of pain. In other words, the findings of these studies indicate that catastrophizers are attending more to their pain, they experience greater emotional distress due to their pain, and areas of the brain that are involved in attenuating pain appear to be functioning less well in catastrophizers.

There are also a number of studies that have shown that catastrophizing is associated with greater pain summation^[5]. Pain summation is a term that is used

to refer to a phenomenon where individuals experience increasing pain as a function of repeated noxious stimulation, even though the intensity of stimulation remains constant. Although the mechanisms underlying pain summation are not completely understood, available findings suggest that the phenomenon arises as a result of 'pain augmenting' processes at the level of the spinal cord and the brain. In

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other words, pain summation does not occur as a result of peripheral processes such as injury or inflammation, it is a phenomenon that occurs in the central nervous system.

One type of pain summation is referred to as temporal summation. Temporal summation of pain has been evidenced primarily as an increase in pain in response to repeated thermal stimulation delivered at a constant intensity and at a specific frequency. There are indications that temporal summation occurs centrally in second-order neurons in the spinal cord as a consequence of sustained C-fiber afferent input [9, 12]. Robert Edwards and his colleagues at Harvard University have shown that catastrophizers show greater temporal summation of pain in response to repeated thermal stimulation than non-catastrophizers [5]. Steven George and his colleagues at the University of Florida have shown that high levels of temporal summation are associated with more severe pain-related disability [6].

Recent research suggests that catastrophizing might also be a risk factor for multisite pain following injury. Multisite pain refers to pain symptoms that are experienced in several regions of the body. Surprisingly, multisite pain is actually more common than single site pain. Only recently has research begun to examine risk factors for multisite pain. Bortsov and his colleagues at the University of North Carolina showed high scores on a measure of catastrophizing were associated with a wider distribution of pain symptoms following whiplash injury.

An experimental study conducted in our laboratory at McGill University showed a similar pattern of findings. The study was led by Nils Niederstrasser, an exchange student from the University of Leuven under the joint supervision of Michael Sullivan and Johan Vlaeyen. In this study, musculoskeletal pain was experimentally induced in healthy participants by means of a delayed-onset muscle soreness (DOMS) protocol [1, 3]. DOMS is characterized by soreness, swelling, stiffness and strength loss in the 24- to 48-hour period following a strenuous bout of exercise [1, 23]. The muscle soreness that develops following strenuous exercise is the result of structural damage to the involved muscles that triggers a localized inflammatory response which produces pain upon movement or tactile stimulation [24]. The findings revealed that individuals with high scores on a

measure of catastrophizing experienced pain in more regions of the body than individuals with low scores on catastrophizing. Although the mechanisms by which catastrophizing might contribute to multisite pain are not known at this time, it is possible that catastrophic thinking might augment stress reactions or shape pro-inflammatory responses to noxious stimulation, potentially contributing to the spreading of pain [2, 4]. The paper describing the results of this study will appear in an upcoming issue of the *Journal of Pain*.

The findings that are emerging in this area are fascinating as they suggest strong linkages between psychological variables and the pathophysiology of pain. The findings clearly caution against inferring that the presence of pain-related psychosocial risk factors somehow questions the authenticity of underlying pain symptoms. It is becoming clearer that the heightened pain and suffering of individuals with high scores on catastrophizing is indeed very real.

Repetition-Induced Summation of Pain Contributes to the Severity Associated with Disability Following Whiplash Injury

Intuitively, it seems hardly surprising that individuals become occupationally disabled following whiplash injury. The fact that individuals who are injured and are experiencing high levels of pain might not be able to work seems like little more than common sense. However, here is where the evidence does not support a common sense idea. Research that has examined the relation between pain severity and occupational disability in individuals who have sustained whiplash injuries suggests that pain severity rarely accounts for more than 10% to 15% of the variance in disability [11].

Before we dispensed entirely with the common sense idea that pain severity should be linked to disability, we wondered whether the measures of pain that had been used in previous research really assessed the 'disability-relevant' dimensions of pain. A review of the literature revealed that studies that had examined the relation between pain severity and disability in individuals with whiplash injuries had relied almost exclusively on measures of spontaneous pain [11]. On measures of spontaneous pain, respondents are asked to rate the severity of the pain associated with their pain condition either on a visual analog

scale or a numerical rating scale. Such measures are typically completed while the respondent is in a sedentary position. Since disability entails limitations of activity participation, we reasoned that measuring pain in the absence of activity demands might not provide the best index of disability-relevant pain. Measures of pain elicited by activity might have greater value as predictors of disability than measures of spontaneous pain.

A study conducted by Tsipora Mankovsky-Arnold, Dr. Sullivan's doctoral student in the Department of Psychology at McGill University, showed that measures of pain elicited by activity were stronger predictors of disability than measures of spontaneous pain. In this study, measures of spontaneous pain, single-point movement-evoked pain, repetition induced summation of activity-related pain (RISP) and disability were obtained on a sample of 142 individuals who had sustained whiplash injuries. The results of the study showed that measures of single-point movement-evoked pain and RISP were stronger predictors of disability than measures of spontaneous pain.

The findings of this study in many ways reflect the multidimensional nature of pain experience, and show that different dimensions of pain might contribute to disability through different mechanisms. At present it is unclear whether these different dimensions of pain experience respond differentially to pain reducing interventions. Given the diverse modes of action of different pain-reduction interventions, it is possible that any one pain-reduction treatment might have an impact on some but not necessarily all dimensions of pain experience associated with whiplash injury. At this time, most pain reducing interventions are evaluated in terms of the degree to which they reduce spontaneous pain. Given the weak relation between measures of spontaneous pain and disability, it is not surprising that most pain-reducing interventions have been shown to have minimal impact on reducing disability. It is possible that treatments that reduce movement-evoked pain might have a greater impact on reducing disability than treatments that reduce spontaneous pain.

Nurses Deliver a Modified Version of the PGAP to Promote Successful Recovery following Total Knee Arthroplasty

The Progressive Goal Attainment Program (PGAP) has been used as an

intervention approach for reducing disability in individuals suffering from a wide range of pain conditions. These have included work-disabled individuals with recent onset low back pain, chronic musculoskeletal pain, whiplash injuries, and individuals with fibromyalgia. In these populations, the objective of treatment has been to reduce pain-related psychosocial risk factors in order to facilitate resumption of occupational activities.

But what of health conditions where pain symptoms are contributing to disability but where resumption of occupational activities might not be the most appropriate or feasible objective? One such condition is osteoarthritis (OA). OA of the lower limbs can be associated with significant pain and mobility impairment, ultimately interfering with individuals' ability to participate in a wide range of important life activities. However, since the majority of individuals with OA of the lower limbs are of retirement age, return to work is not a reasonable objective for these individuals.

A version of the PGAP, modified for use with individuals about to undergo total knee replacement is currently being tested. The goal of PGAP-TKA is to reduce pain-related psychosocial risk factors in order to promote successful return to meaningful activity following knee replacement surgery. One arm of the clinical trial is being conducted in Halifax in collaboration with orthopaedic surgeons, Dr. William Stanish, Dr. Michael Dunbar and Dr. Glen Richardson. Another arm of the trial is being conducted in Montreal in collaboration with orthopaedic surgeons Dr. Michael Tanzer and Dr. Michel Malo. All treatment-related materials (e.g., PGAP Treatment Manual, PGAP-TKA Client Workbook, and the PGAP-TKA Video) have been translated into French such that the trial could be conducted in both official languages.

In the PGAP-TKA trial, nurses will be used as the PGAP providers. Since the PGAP-TKA trial is intended to be initiated prior to discharge from the hospital, we considered that nurses, already being part of the treatment team, were probably best suited to act as the PGAP providers.

This is the first trial where PGAP trained nurses will be used as interventionists. In previous PGAP trials, other rehabilitation disciplines have been used as interventionists such as psychologists, social workers, occupational therapists and physiotherapists. If we are able to demonstrate that PGAP-TKA can be effectively delivered by nurses, the findings would broaden the range of health disciplines that make up the PGAP evidence base, and in turn, increase the accessibility to PGAP services.

Update on Central Referral Network

In April of this year, we launched the Central Referral Network in order to streamline the process of referring clients for PGAP services. The Central Referral Network is a centralized system of referral that provides referral sources access to a large network of PGAP providers in every province of Canada. Referral agents have provided us with positive feedback about the Central Referral Network, citing ease of access, timely initiation of treatment, and positive return to work outcomes as significant advantages of the Central Referral Network.

More information about the Central Referral Network can be obtained by calling 1-416-977-PGAP (7427) or by visiting our new website: www.PGAPworks.com.

Providers who are interested in becoming part of the Central Referral network are encouraged to contact the Centre for Rehabilitation and Health at: info@centrefor rehab.com

PGAP 4th Edition Treatment Manuals

PGAP 4th Edition Treatment Manuals are now available for purchase by 3rd edition trained PGAP Providers*. To obtain an order form please email us: info@PGAPworks.com

*Please note that earlier editions of PGAP require retraining in order to be considered able to work with individuals with conditions other than pain-related disability.

2015 PGAP Workshops

March 27 & 28, 2015

Vancouver, British Columbia

November 6 & 7, 2015

Edmonton, Alberta

November 13 & 14, 2015

Toronto, Ontario

A PGAP Workshop in French is anticipated in the Fall of 2015. Please check our website for details, or if you wish to be added to our notification list, please email: info@PGAPworks.com

Please note that registration opens late December for Vancouver and mid-January for Edmonton and Toronto.

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