

The Effect of Exercise/Physical Activity on Chronic Pain and Pain-Related Mental Health Issues, In Computer Workers with Repetitive Strain Injuries

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Introduction

With the increased use of computers in the workplace, more and more workers are developing repetitive strain injuries (RSI). In 2003, Statistics Canada reported that (RSI's) affected an estimated 2.3 million adult Canadians (1 in 10). In 2004, RSI's accounted for more than 50% of all injuries reported to the Ontario Workplace Safety and Insurance Board (WSIB) (Laurentian University, 2004; Murphy et al., 2006). According to three unions, Public Service Alliance of Canada (PSAC, 2003), Canadian Union of Public Employees (CUPE, 2003), and Professional Institute of Public Service of Canada (PIPSC, 2003) and a Health Canada Occupational Health Therapist (Frantz-Hubert Sully, 2005), the number of public service employees with RSI's is increasing. According to National Institute of Neurological Disorders and Stroke (2006) "Today, pain has become the universal disorder, a serious and costly public health issue, and a challenge for family, friends, and health care providers who must give support to the individual suffering from the physical as well as the emotional consequences of pain".

RSI's have a high cost:

Individual:

- Chronic pain
- Pain-related mental health issues "invisible disability"
- Financial burden

Social (lost-time days & annual productivity loss):

- Directly from RSI's (statistics in Ontario)
- 1996-2004 "nearly 27 million lost-time days"
- "estimated loss of \$26 billion a year"
- 2004 over 50% of all injuries reported to WSIB

- Indirectly from "invisible disability"
- 35 million number of workdays lost each year
- 35\$ billion estimated annual productivity loss

Definition: family of injuries affecting tendons, tendon sheaths, nerves, muscles, and joints. EDS persons are at higher risk of injury and pain.

Symptoms: numbness, tingling, dull ache to severe pain, clumsiness, muscle wasting, and, especially in the hands, loss of strength and agility, and loss of sensation. Physical symptoms \Rightarrow mental symptoms (e.g., anxiety and depression).

Causes: repetitive rapid movements of a body part without rest (e.g., repetitive finger movements on a keyboard/mouse).

Consequences: if worker is not moved from the job immediately \Rightarrow permanent & irreversible damage to the hand, wrist, forearm, elbow, shoulder and/or neck.

Research Questions

General research question:

- How does Repetitive Strain Injury (RSI) affect the lives of computer workers and what they do to alleviate its symptoms?

Specific research questions:

- How does exercise/physical activity (E/PA) participation help RSI-injured computer workers live with chronic pain & pain-related mental health issues?

- How is E/PA prescription used by health professionals to help RSI-injured computer workers live with chronic pain & pain-related mental health issues?

Significance of the Study

• Specific literature on RSIs does not make a strong reference to the use of E/PA for treating chronic pain and pain related mental health issues as is done in the general literature on chronic pain. This study will add to the literature.

- This study proposes:
 - a new holistic approach to understanding and addressing RSIs,
 - the use of E/PA to help computer workers

Theoretical Framework

Derived from: complexity, Yin-Yang & postmodernism approaches

Perceives human body made of components that are:

- fundamentally connected & balanced
- mutually interacting & complementing each other
- \Rightarrow cannot be treated in isolation, such as RSIs, pain, anxiety, and depression

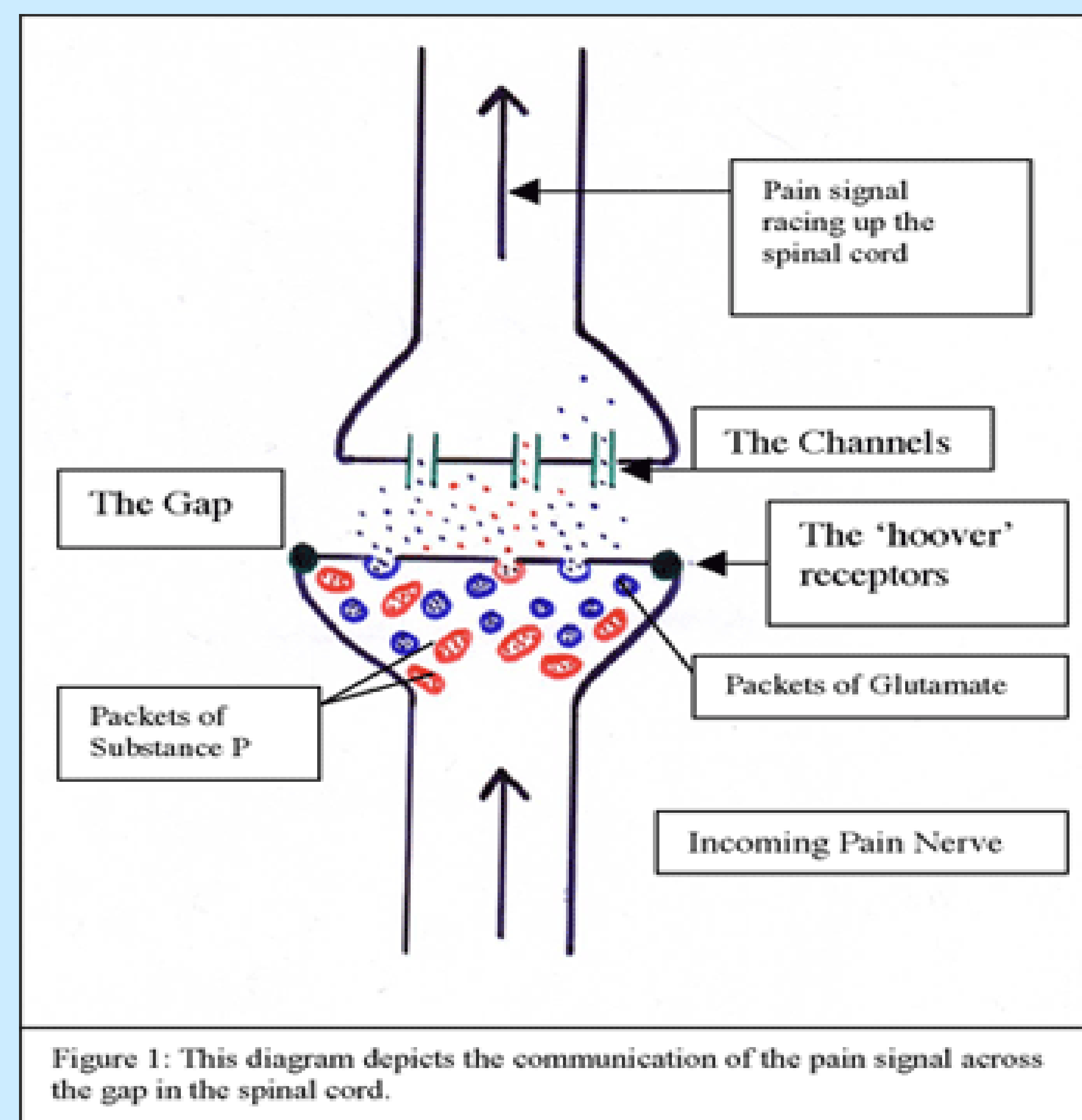
Allows the study to propose a new holistic approach to:

- understanding and addressing RSIs as they impact on the physical and mental health of the injured workers, and
- using E/PA to help RSI-injured computer workers live with chronic pain and pain-related mental health issues

Pain from physical injury (RSI) leads to psychological injury (depression)

Functional limitation may range from minimal to gravely disabling. Patients frequently experience weakness of the wrists and upper arms. They initially have difficulty with opening jar lids, lifting heavy objects (groceries), stirring ingredients or driving a stick care. Any extended periods of writing, keyboarding, sitting, standing, lifting, or driving may incur significant pain and weakness. Pain is alleviated by rest in the early stages of the disease, but as fatigue and improper recruitment progresses, pain is constant. Patients may not be able to brush their teeth, blow-dry their hair, or hold their child. Pain and weakness become crippling, and most instrumental tasks are difficult to handle. At this stage depression is common, and a sense of hopelessness builds in over the lack of control in their lives (Gilbert et al., 1996)

Pain Pathways: How your body signals and monitors pain (Longley, 2005)



Exercise/Physical Activity

• Disuse or deconditioned syndrome: inactivity \Rightarrow negative impact on chronic pain, muscles, anxiety, and depression.

• 1 week total immobility \Rightarrow muscle loses 1/3 size & power

• Pain management goal: improve functioning of chronic pain patients

• Physical rehabilitation goal: improve their functioning through therapeutic exercises (range of motion, stretching, strengthening, endurance, & body awareness)

\Rightarrow enable them return to work (office & house) and participate in recreational activities

\Rightarrow improve their quality of life

As RSIs heal E/PA begins:

• **Physical impact:** E/PA stretches and strengthens muscles and joints \Rightarrow increases flexibility and energy, improves sleep, and helps prevent relapses.

• **Psychological impact:** E/PA produces endorphins \Rightarrow blocks transmission of electrical signals between nerve cells carrying pain messages \Rightarrow helps alleviate anxiety, depression, fatigue, and sleep problems; \Rightarrow improves confidence, social interaction, and prevents recurrence.

\Rightarrow **End result:** regular E/PA is a weapon to combat pain and pain-related mental health issues.

Methodology

Qualitative data collection provides:

- naturally occurring real-life situations
- insider's perspective
- rich insight into human behavior

Limitations:

- asking computer workers to talk about their daily pain without feeling that they are complainers and/or weak
- asking health professionals to talk about the treatment they prescribe for pain, anxiety and depression for RSI
- a few may refuse/reluctant to be tape-recorded

Delimitations:

- small sample size that limits the ability to draw conclusions or generalizations about computer workers and health professionals

Context and participants:

- Two samples:
 - 8 computer workers living with RSI
 - 8 health professionals treating RSI, pain, anxiety, depression
- Gender: equal number of females (9) and males (7)
- Age distribution: 29 – 65
- Recruitment: snowball sampling

Procedures of data collection:

- Measurement instruments: two interview guides to conduct face-to-face semi-structured interviews
- Questions: non-intrusive; open- & close-ended; use of probes
- Interviews: tape recorded and manually transcribed

Data analysis:

- Use of NVivo qualitative software

Results

Computer workers' emerging themes:

- pain symptoms
- pain frequency
- repetitive work
- anxious feelings
- depressed feelings
- pain coping strategies
- pain response
- physical activity
- pain perception
- mood perception

Health professionals' emerging themes:

- symptoms
- treatments
- patient understanding

Key Findings

• **RSI pain** interfered: daily activities, night's sleep, quality of life, and led to anxiety and depression

• **E/PA participation:** RSI-injured computer workers engaged in E/PA, used creativity and ambidexterity, felt upbeat, and forgot their pain

• **E/PA prescription:** Health professionals recommended, encouraged, demonstrated, and advocated E/PA

\Rightarrow Regular E/PA helped RSI-injured computer workers live with chronic pain, anxiety and depression.

Physical aspect of pain:

• chronic pain \Rightarrow anxiety & depression \Rightarrow intensify pain

Psychological aspect of pain:

• inactivity \Rightarrow negative impact on chronic pain & muscles \Rightarrow anxiety & depression

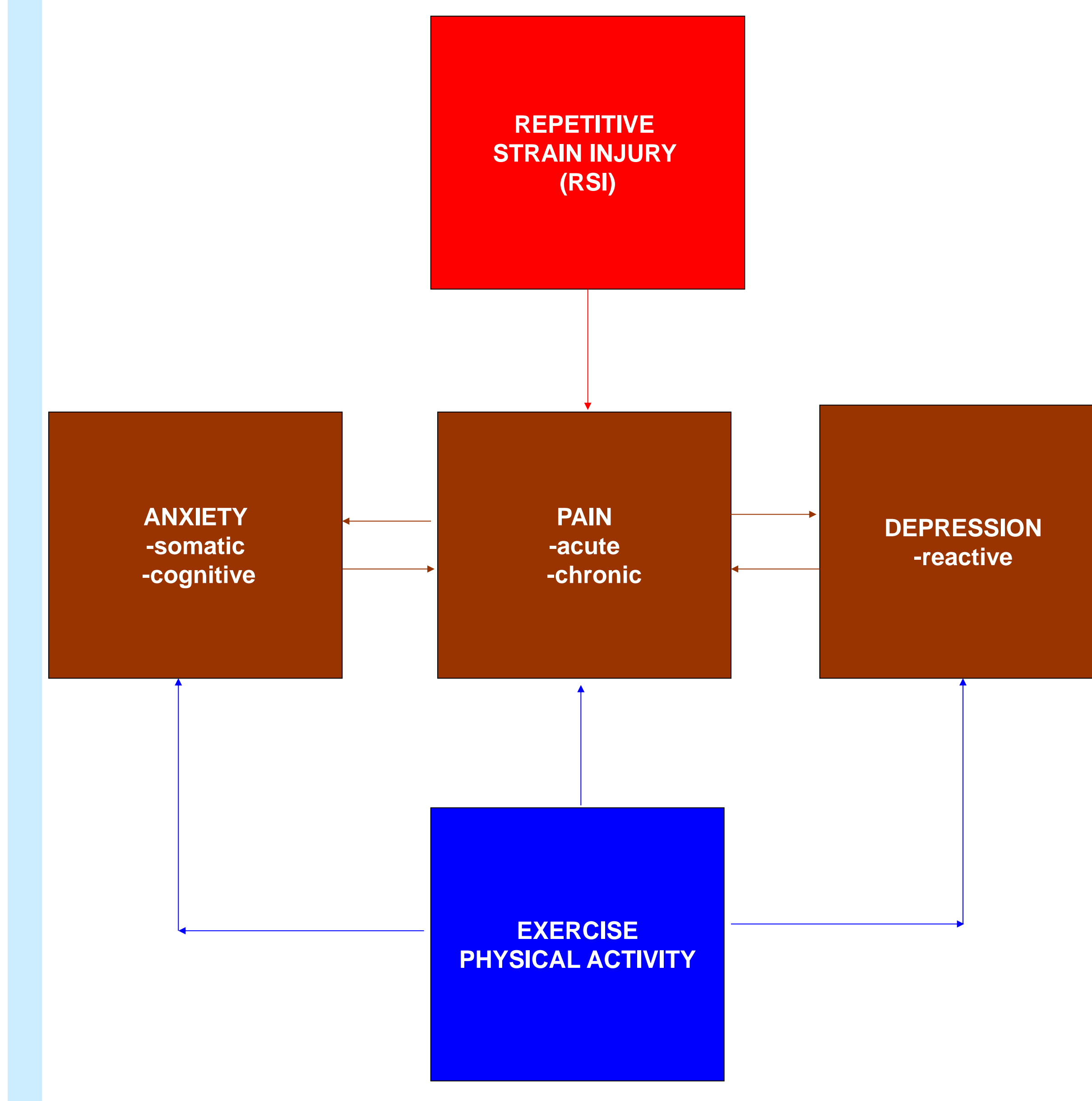
Physical benefits of E/PA

- stretches & strengthens muscles \Rightarrow stronger muscles
- increases flexibility \Rightarrow joints will move with less pain
- increase energy level \Rightarrow cope with the pain
- \Rightarrow helps prevent relapses

Psychological benefits of E/PA

• endorphins production \Rightarrow decrease pain & increase pleasure \Rightarrow helps prevent relapses

RSI Consequences and E/PA Effect on Pain and Pain-Related Mental Health Issues



Conceptual Model

Conceptual Model developed subsequent to:

- **General literature on pain:**
 - strong link between chronic pain & pain-related mental health issues
 - strong reference to positive effects of exercise.
- **Specific literature on RSI:**
 - strong link between chronic pain & pain-related mental health issues
 - NO reference to positive effects of exercise.
- **Interviews** with RSI-injured computer workers and health professionals:
 - strong reference to positive effects of exercise.

Conclusions

Occupational health is an important strategy to ensure the health of workers. The workplace has been established as one of the priority settings for public health action into the 21st century by the World Health Organisation, as it directly influences the physical, mental, economic and social well-being of workers and in turn the health of their families, communities and society (Statistics Canada, 2006, Occupational and environmental health studies).

Improved understanding of the benefits of E/PA on chronic pain and pain-related mental health issues in RSI-injured computer workers will:

- Provide them with more effective treatment options
- Ameliorate their recovery
- Facilitate their return into the workforce
- Enhance their overall quality of life

Researcher

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