



Carpal Tunnel Syndrome

Clinical Pathway for Work-Related Injury

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Introduction

This clinical pathway is intended to serve as an instructional aid. **It is designed for clinicians treating work-injured patients with carpal tunnel syndrome (CTS)**¹. The goal of this pathway is to provide clinicians with evidence-based therapeutic options that will help reduce the incidence of those who develop intractable pain from CTS in the American workforce.

The authors depend on research studies to verify the accuracy of the information offered and to explain generally accepted practices. However, we cannot guarantee its correctness. Professionals in the field may have different opinions and because of continual progress in medical research, we strongly recommend that readers independently confirm information on specific drugs and interventions.

Furthermore, it should be noted that this clinical pathway is not intended to constitute inflexible treatment recommendations, and is not a scientific treatise on the subject. Modifications to the pathway will undoubtedly be necessary as a result of new research and practice-based evidence. For this reason it must be broad enough to incorporate a wide range of diagnostic and treatment modalities. This allows for philosophical and practice differences between the various licensed health care practitioners. It is not intended either to replace a clinician's judgment or to establish a protocol for all patients at risk for development of a chronic pain condition. It is expected that a provider will establish a plan of care based on an individual patient's needs, taking into account the individual's medical condition, personal needs, and preferences, as well as the provider's experience. Treatment may differ from that outlined here.

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Intended Users

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Goals

This pathway will focus on treatment recommendations health care providers can begin to consider in an effort to assure:

- The work-injured are receiving high quality, evidence based therapeutics,
- A reduction in the number of work injured who develop intractable pain from CTS and
- A reduction in unnecessary costs associated with delayed recovery and inefficient resource utilization

Patient Population

Adult injured workers 18 years or older with or at risk for development of CTS.

¹ See definitions

Objectives

- To improve the clinical and financial outcomes associated with the work-injured with or at risk for development of CTS.
- To serve as an instructional aid for clinicians when treating injured workers at with or risk for development of CTS.
- To provide nurse advocates and physicians with information necessary to make recommendations about the medical necessity and clinical appropriateness of treatment.

The authors are confident that each recommendation if implemented with clear qualitative and quantitative goals and objectives will improve the quality of care available to the Massachusetts workforce and help create an evolutionary constructive dialog between those who pay for chronic pain care and those who provide clinical services.

Definitions

BMI (Body Mass Index): The weight in kilograms, divided by height in meters squared.

*Note: to convert pounds to kilograms, multiply pounds by 0.455, to convert inches to meters, multiply inches by 0.0254.

Carpal Tunnel Syndrome (CTS)²: A neuropathy caused by compression of the median nerve within the carpal tunnel. Classical symptoms include numbness, tingling, burning or pain in at least two of the three digits supplied by the median nerve (i.e., the thumb, index, and middle fingers). Nocturnal symptoms may be severe. Patients often complain of waking at night with numbness or tingling in their fingers that requires them to change position or shake the hand for relief.

Neuropathic pain³: Pain due to nerve injury, neurologic disease, or the involvement of nerves by other disease processes.

Yellow Flag Risk Factors⁴: Co-morbid factors associated with an increase risk of compromised recovery. These include: smoking, obesity, diabetes, history of physical abuse or sexual assault, history of previous injury, work-related injury, absence and job dissatisfaction, fear avoidance behavior, depressive mood, substance abuse history.

² Ashworth, N 2007

³ Ballantyne J and Mao J, 2003

⁴ Kendall, NAS et al., 1997

Major Recommendations

Weeks 1 – 6

I. Evaluation & History⁵

Critical to the prevention and/or treatment and management of CTS is a thorough evaluation and appropriate diagnosis of the initial presentation of symptoms.

In addition we recommend:

1) Initial evaluation of the work-injured to include screening for factors associated with risk of CTS⁶:

- a) Previous wrist fracture
- b) Rheumatoid arthritis
- c) Osteoarthritis of the wrist and carpus
- d) Obesity
- e) Diabetes, and the use of insulin, sulphonylureas, or metformin
- f) Thyroxine
- g) Female gender⁷
- h) Psychological distress⁸

2) Document: Duration, evolution, precise anatomic locations and intensity of all symptoms.

3) Evaluation of work-relatedness (for claim acceptance)⁹

- a) Any activity requiring extensive or continuous use of the hands in work may be an appropriate exposure. In general, one of the following work conditions should be occurring on a regular basis:
 - i) Repetitive hand use, especially for prolonged periods (e.g., keyboard users), against force (e.g., meat cutters), or with awkward hand positions (e.g., grocery checkers), with repeated wrist flexion, extension, or deviation as well as forearm rotation, or with constant firm gripping
 - ii) The presence of regular, strong vibrations (e.g., jackhammer, chainsaw).
 - iii) Regular or intermittent pressure on the wrist (Note: acute carpal tunnel syndrome may be associated with acute trauma [i.e., fracture, crush injury of wrist, etc.])
- b) The types of jobs that are most frequently mentioned in the literature or reported in Labor and Industry's (L&I's) data include meat cutting; seafood, fruit, or meat processing or canning; carpentry; roofing; dry walling; boat building; book binding; wood products work; dental hygienist; and intensive word processing. This is not an exhaustive list. It is only meant to be a guide in consideration of work-relatedness. If the history of exposure is unclear, then speaking directly with the employer or claimant or doing a walk through to obtain more detailed information on job duties would be critical.

⁵ See also Commonwealth of Massachusetts Department of Industrial Accidents Treatment Guidelines for CTS at <http://www.mass.gov/dia/>

⁶ Geoghegan JM et al. 2004

⁷ Becker J et al. 2002

⁸ Roquelaure Y et al. 2001

⁹ Adapted from Washington State Department of Labor and Industries. Diagnoses and treatment of work-related carpal tunnel syndrome (OCTS). Olympia (WA): Washington State Department of Labor and Industries; 2002 Aug.

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Special Cases

Questions may arise in several specific situations that may raise questions about the validity of the claim for work-related carpal tunnel syndrome (OCTS) or about the need for surgery.

- a) Work-relatedness may not be obvious. Some work exposures do not meet the guidelines for work-relatedness. If there is a question about the job exposure and whether such exposure could cause OCTS, the claim manager should refer the case to the occupational medical consultant.
- b) Surgery may be requested in those injured workers whose clinical picture and work relatedness is quite clear, but whose nerve conduction testing (NCVs) are normal. Most clinicians agree that a minority (<10%) of patients with clinical OCTS may have normal NCVs. Options here may be the following:
 - i) Were the most sensitive and specific NCV tests done (e.g., palm-wrist median sensory latency or inching technique)? If not, request that one be done.
 - ii) If OCTS is not documented by clinical criteria and NCV testing, other clinical problems related to repetitive use (i.e., tendonitis) should be investigated and treated appropriately. It would also be important to rule out other neurologic causes of tingling in the hands (i.e. cervical disc disease). Referral to an appropriate specialist (neurologist, physiatrist) would be prudent in such cases.
- c) Carpal tunnel syndrome may also be caused by anything that decreases the cross-sectional area of the carpal tunnel or adds to the volume of the carpal tunnel, resulting in increased pressure on the median nerve. This could occur by distortion of the bones or ligaments by fracture or crush injury of the forearm or hand associated with generalized or chronic swelling (edema).
- d) Carpal tunnel syndrome may be associated with other chronic conditions that may cause nerve damage or predispose a nerve to injury from compression. The most common of these conditions is diabetes. The key test here is whether, in spite of the presence of such condition, the symptoms of OCTS can be documented to have begun only after beginning work at the job in question.
- e) A predisposing physiological condition is pregnancy wherein increased plasma volume increases pressure within the carpal tunnel. In such cases, symptoms universally disappear immediately after birth. If they do not, other etiologies (e.g., work-related, diabetes) should be pursued.

4) Evaluate for yellow flag risk factors

In addition to risk factors for CTS listed above in section 1, initial evaluation to include screening for **yellow flag**¹⁰ risk factors that are associated with a high risk for compromised recovery (see Appendix A “Assessing and treating psychological and behavioral risk factors”).

Yellow Flag Risk Factors:

- Smoking
- History of physical abuse or sexual assault
- Currently in litigation
- History of alcohol or substance abuse
- Work-related injury
- Absence and job dissatisfaction
- Fear avoidance behavior and reduced activity levels
- An expectation that passive, rather than active, treatment will be beneficial
- A tendency to depression, low morale, and social withdrawal
- Social or financial problems
- Related sick leave
- Poor general health

¹⁰ Yellow Flag Risk Factors: Co-morbid factors associated with an increase risk of compromised recovery. See definitions.

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Additional screening may include these moderate levels of evidence for high risk:

- Employment status
- Low wage earner
- Workers compensation
- Lifting time per day
- Work postures^{11,12,13}
- Single parent status
- Approaching retirement age

II. Diagnosis & Treatment¹⁴

1) Assign nurse advocate

A nurse advocate may be assigned at the time of initial injury or symptom to follow the patient until maximum medical improvement (MMI)¹⁵ has been reached.

2) First visit: with Primary Care Physician MD/DO

Determine severity:

a) Mild/moderate (*Go to Initial Conservative Treatment*):

- i) Symptoms: pain/numbness in hand/wrist/forearm, below the elbow, with tingling that is primarily in thumb, index, and long finger (Katz hand diagram and hypesthesia index finger compared to little finger), with **nocturnal awakening**, impaired dexterity, and having to shake the hand for relief (Flick sign).
- ii) Tests: Phalen's/Tinel's signs positive (not always useful), decreased sensitivity by 2-point discrimination test (moving versus static) for hypalgesia. Also consider Semmes Weinstein monofilament test, Durkan's pressure provocation test, closed fist sign, square fist sign, inching technique.
- iii) Muscle atrophy: Mild weakness of thenar muscles (thumb abduction)
- iv) Recommended: findings that best distinguish between patients with electrodiagnostic evidence of carpal tunnel syndrome (CTS) and patients without it are hypalgesia in the median nerve territory (likelihood ratio [LR] 3.1), classic or probable Katz hand diagram results (likelihood ratio 2.4), and weak thumb abduction strength (likelihood ratio 1.8).
- v) History/exam, comorbidities: diabetes, hypothyroidism, rheumatoid arthritis, obesity, hypertension, inactivity, age, yellow flag risk factors
- vi) Concurrent pregnancy: CTS likely to resolve on its own within 6 weeks after delivery.

b) Severe (*Go Directly to Electrodiagnostic Testing*):

- i) Muscle atrophy: severe weakness of thenar muscles
- ii) Test: 2-point discrimination over 6 millimeters
- iii) Rule out diagnoses:
 - Cervical radiculopathy
 - Tendonitis
 - Osteoarthritis
 - Thoracic outlet syndrome, brachial plexus disorders

¹¹ Green CR, et al. 2001

¹² Fayad F 2004

¹³ Samanta J, et al. 2003

¹⁴ Adapted from Work Loss Data Institute. Carpal tunnel syndrome. Corpus Christi (TX): Work Loss Data Institute; 2003.

¹⁵ Maximum Medical Improvement: The treating physician determines that no further intervention will significantly affect the patient's medical problem

III. Treatment

Mild/Moderate – Initial Conservative

1) First visit (day 1):

- a) Prescribe alteration of activity (home and work), frequent breaks, stretching, night and possibly day splint, appropriate analgesia (i.e., acetaminophen)¹⁶, back to work – modified duty if condition caused by job, possible ergonomic evaluation of job.

Official Disability Guidelines (ODG) Return-To-Work Pathways

- Conservative treatment, modified work (no repetitive use of hand/wrist): 0 days
- Conservative treatment, regular work (if not cause of or aggravating to disability/use of splint): 0-5 days

**Evaluation of work-relatedness (for claim acceptance) GO TO I2 above.

2) Second visit (day 14 – about 2 weeks after first visit)

- a) Document progress
- b) Recommend wrist neutral night splint
- c) Consider ergonomic evaluation according to OSHA standards¹⁷
- d) Treat Yellow Flag Risk Factors

See Appendix A

3) Third visit (day 28 – about 1 month after first visit)

- a) Document progress
- b) Corticosteroid injection trial^{18,19} (high likelihood of relief, but may have recurrence of symptoms within several months – initial relief of symptoms good indicator for success of surgery, even possible to skip Electrodiagnostic Testing). Should be performed by musculoskeletally trained physician.
- c) Vitamin B6 therapy has been successful if deficient, but is controversial.
- d) There is limited evidence to indicate that splinting, laser-acupuncture (see also Commonwealth of Massachusetts Industrial Accidents Guidelines for CTS Treatment at <http://www.mass.gov/dia>) yoga, and therapeutic ultrasound may be effective in the short to medium term (up to 6 months). The evidence for nerve and tendon gliding exercises is more tentative. The evidence **does not** support the use of nonsteroidal anti-inflammatory drugs, diuretics, pyridoxine (vitamin B6), chiropractic treatment, or magnet treatment^{20,21,22}.

ODG Return-To-Work Pathways

Conservative treatment, regular work (if work related): 28 days

Conservative treatment, regular work (with severe nerve impairment): indefinite

4) Fourth visit (day 42 – about 6 weeks after first visit)

- a) Refer for Electrodiagnostic Testing

¹⁶ One small RCT found no significant difference with tenoxicam versus placebo in mean global symptom score after 2 or 4 weeks. One RCT found no significant difference in symptom severity scores with ibuprofen plus nocturnal wrist splint versus chiropractic manipulation plus ultrasound plus nocturnal wrist splint after 9 weeks. (Marshall, S 2004)

¹⁷ www.OSHA.gov

¹⁸ Local glucocorticoid injection results in long-term improvement in nerve conduction parameters, symptom severity and functional scores in patients with mild CTS (Agarwal V, et al. 2005).

¹⁹ Over the short term, local steroid injection is better than surgical decompression for the symptomatic relief of CTS. At 1 year, local steroid injection is as effective as surgical decompression for the symptomatic relief of CTS (Ly-Pen D, et al. 2005).

²⁰ Goodyear-Smith F, et al. 2004

²¹ Muller M, et al. 2004

²² O'Connor D, et al. 2003

IV. Electrodiagnostic Testing

All severe cases, plus mild/moderate cases after Initial Conservative Treatment above:

- 1) Refer to specialists certified in electrodiagnostic medicine, for electromyography (EMG)/Nerve Conduction Studies.
- 2) Positive test: refer for evaluation for Carpal Tunnel Release

V. Carpal Tunnel Release

1) Re-evaluation:

- a) No improvement:
 - i) Diagnosis correct?
 - 1) Rule out other neurologic causes of tingling in the hands (i.e. cervical disc disease). Referral to an appropriate specialist (neurologist, physiatrist) would be prudent in such cases.
- b) Moderate but incomplete improvement after conservative measures to include:
 - i) Wrist neutral night splint
 - ii) Positive response to steroid injection
 - iii) Positive EMG
- c) Consider surgery performed by Hand Surgeon: Orthopaedic Surgeon, Neurosurgeon, Plastic Surgeon, or General Surgeon:
 - i) Outpatient basis
 - ii) May be open or endoscopic, depending upon experience of surgeon^{23, 24, 25}
 - iii) If bilateral, schedule separate surgeries (second surgery approximately 2 – 4 weeks after initial surgery)
- d) Expected outcome:
 - i) Mild/moderate cases: over 90% success with complete recovery after failure of Initial Conservative Treatment
 - ii) Severe cases: Complete recovery is unlikely, but 90% will benefit from at least partial improvement of pain and approximately 70% will benefit from sensibility improvement.
 - iii) In a small percentage of patients, the scar may take longer to mature before going back to work.

2) Post-surgical treatment:

- a) Splint – day and night: not recommended
- b) Stitches out in 10 to 14 days
- c) Physical Therapy: A short course may be needed

²³ Minimally invasive carpal tunnel decompression appears to be more effective but more costly. Initial analysis suggests that the additional expense for such a small improvement in function and no improvement in symptoms would not be regarded as value-for-money, such that minimally invasive carpal tunnel release is unlikely to be considered a cost-effective alternative to the traditional open surgery procedure (Lorgelly PK, et al. 2005).

²⁴ Study results support the observation that a higher incidence of incomplete release of the carpal tunnel is found with endoscopic surgery than with open release (Hulsizer DL et al. 1999).

²⁵ Data revealed a statistically higher incidence of recurrence of carpal tunnel syndrome after endoscopic release compared with the traditional “open” release. (Concannon MJ et al. 2000).

ODG Return-To-Work Pathways

- Endoscopic surgery, modified work: 2 – 4 weeks
- Endoscopic surgery, regular work, non-dominant arm: 28 days
- Endoscopic surgery, regular/repetitive/heavy manual work, dominant arm: 42 days to indefinite
- Open surgery, modified work: 2 – 4 weeks
- Open surgery, regular work, non-dominant arm: 28 - 42 days
- Open surgery, regular/repetitive/heavy manual work, dominant arm: 6 weeks to indefinite

3) Failed Carpal Tunnel Release:

- a) Go To section VIII Re-evaluation
- b) Repeat Electrodiagnostic Testing
- c) Repeat Carpal Tunnel Release (*by fellowship-trained Hand Surgeon*)

VI. Return to Work after OCTS Surgery

The vast majority of persons with work-related OCTS are expected to have dramatic relief of their symptoms after carpal tunnel decompression surgery and should return to their same job. Return to work, with or without job modification, should be tried in most people. If symptoms worsen or reappear after return to work, repeat NCVs will help to sort out if OCTS has recurred and if surgery successfully removed the pressure on the median nerve (NCVs will improve with successful surgery, although they may not return completely to normal).

VII. Post surgical follow-up approximately every 4 weeks for 3 months

Follow-up visit:

1) Improving

- a) Continue Conservative Treatment Plan
- b) Transitional work where appropriate

2) No Improvement

- a) Comprehensive physical & psychosocial re-evaluation
- b) Diagnosis correct?
- c) Behavioral or psychosocial issues?
 - i) Complete psychosocial re-evaluation (*see Appendix A*)
 - ii) Treat or Refer
- d) Refer to Intensive Multidisciplinary Treatment Program (*see Appendix B below*)

12 Weeks

VIII. Re-evaluation

1) Improving

- a) Continue conservative treatment
- b) Return to work / modified work schedule

2) No Improvement

- a) Comprehensive physical & psychosocial re-evaluation
 - i) For those patients who do not improve with conservative measures and/or surgery after 12 weeks a comprehensive re-evaluation should be done

3) If failed Carpal Tunnel Release

- a) Repeat Electrodiagnostic Testing
- b) Repeat Carpal Tunnel Release (*by fellowship-trained Hand Surgeon*)

4) Chronic Pain Treatment

- a) Active Rehabilitation
 - i) The treatment of chronic pain should include:
 - Intensive Multidisciplinary Treatment Program Education (*see Resources*)
 - Treatment of Risk Factors
 - Active self-management
 - Gradual resumption of normal light activities as tolerated
 - Prevention – good body mechanics
 - b) Pain management
 - ii) There is limited evidence to indicate that splinting, laser-acupuncture, yoga, and therapeutic ultrasound may be effective in the short to medium term (up to 6 months). The evidence for nerve and tendon gliding exercises is even more tentative. However, it would be reasonable to try some of the techniques with less evidence if the better ones are not successful.

IX. Re-evaluation for MMI & continue active rehabilitation customized to the patient's individual lifestyle, preferences, pain type and pattern and recovery.

Resources

Chronic Pain Management Resources

- Managing Pain Before It Manages You, Revised Edition by Margaret Caudill, MD, 2002, The Guilford Press, New York, New York.
- The Chronic Pain Control Workbook: A Step-By-Step Guide for Coping With and Overcoming Pain by Ellen Mohr Catalano, Ph.D. Kimeron N. Hardin. 1987. New Harbinger Workbooks.
- Learning to Master Your Chronic Pain by Robert Jamison. 1996, Professional Resource Press, Sarasota, Florida.
- Mayo Clinic on Chronic Pain (Mayo Clinic on Health) by Jeffrey Rome. 2002, Mayo Clinic.
- The Chronic Pain Solution: Your Personal Path to Pain Relief by James N Dillard MD with Leigh Ann Hirschman. 2003, Bantam Dell, New York, New York.
- Freedom from Chronic Pain: The Breakthrough Method of Pain Relief Based on the New York Pain Treatment Program at Lenox Hill Hospital by Norman J. Marcus, Jean S. Arbeiter. 1995.
- The Truth About Chronic Pain: Patients and Professionals on How to Face It, Understand It, Overcome It by Arthur Rosenfeld. 2004.

Smoking Cessation Resources

QUITWORKS

A free, evidence-based stop-smoking service to which health care providers may refer any Massachusetts patient, regardless of health insurance status.

1-800-TRY-TO-STOP (1-800-879-8678)

1-800-8-DEJALO (1-800-833-5256)

1-800-TDD-1477 (1-800-833-1477)

FAX: 1-866-560-9113

www.trytostop.org

Strategies & Skills for Quitting

U.S. Surgeon General's five keys to quitting: get ready, get support, learn new skills and behaviors, get and use medication, and be prepared for relapse.

http://aolsvc.health.webmd.aol.com/hw/smoking_cessation/aa151797.asp

National Cancer Institute

Via the Internet web site at <http://cancer.gov>

or call 1-800-4-CANCER

Weight Control Resources

American Dietetic Association

216 West Jackson Boulevard

Chicago, IL 60606-6995

(800)366-1655

<http://www.eatright.org>

American Obesity Association

1250 24th Street, NW
Suite 300
Washington, DC 20037
(800)98-OBESE (986-2373)
<http://www.obesity.org>

Food and Nutrition Information Center

<http://www.nal.usda.gov/fnic/>

Food Safety Information

<http://www.foodsafety.gov/>

Dietary Questionnaire

National Cholesterol Education Program. Short dietary questionnaire to assess adherence to a step I and step II diet. In: Second Report of Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. 1993, National Institutes of Health. National Heart, Lung, and Blood Institute: Bethesda, Md. P.IIA-1.

Nutrition.gov

<http://www.nutrition.gov>

Physical Activity Questionnaire

Blair SN. How to assess exercise habits and physical fitness. In: Matarazzo JD, Miller NE, Weiss SM, Herd, JA eds. Behavioral Health. New York, NY: Wiley; 1984: 424-447.

Shape Up America

4500 Connecticut Avenue
Washington, DC 20008
(202)244-3560
<http://www.shapeup.org>

Weight-Control Information Network

1 Win Way
Bethesda, MD 20892-3665
Phone: (877) 946-4627

Addiction Disorders Resources

The American Society of Addiction Medicine

4601 North Park Avenue
Arcade suite 101
Chevy Chase, MD 20815
301/6563920
email@asam.org
www.asam.org

NIAA: Helping patients with alcohol problems

<http://www.niaaa.nih.gov/publications/Practitioner/HelpingPatients.htm>

NIAA: How to cut down on your drinking

<http://www.niaaa.nih.gov/publications/handout.htm>

Physical Abuse or Sexual Assault

Grant me the serenity... Resource Directory for survivors of abuse

http://open-mind.org/Directory/index.php?ax=list&cat_id=6

National Clearinghouse on Child Abuse and Neglect Information

<http://nccanch.acf.hhs.gov/>

Abuse Resources available at the Center for Disability Resources Library

<http://uscm.med.sc.edu/CDR/abuse.html>

National Sexual Assault Hotline

1/800-656-HOPE

Rape, Abuse & Incest National Network (RAINN)

<http://www.rainn.org/>

4 Woman.Gov

The National Women's Health Information Center

<http://www.4woman.gov/faq/sexualassault.htm>

Screening for Psychological Risks

Beck Depression Inventory (BDI)

The BDI is a self-administered 21 item self-report scale measuring supposed manifestations of depression.

The BDI takes approximately 10 minutes to complete, although clients require a fifth – sixth grade reading age to adequately understand the questions. A copy of the BDI or any further information on it can be obtained through

The Psychological Corporation at: <http://harcourtassessment.com/HAIWEB/Cultures/en-us/default>.

The Brief Symptom Inventory (BSI) or the short version of the Symptom Check List (SCL-90) can be used to evaluate psychological problems including anxiety in a variety of medical settings.

The BSI test is brief and requires only 8-10 minutes to complete, making it well-suited for repeated administrations over time to evaluate patient progress. The instrument provides an overview of a patient's symptoms and their intensity at a specific point in time. The Global Severity Index (GSI) is designed to help quantify a patient's severity-of-illness and provides a single composite score for measuring the outcome of a treatment program based on reducing symptom severity. The reliability, validity, and utility of the BSI instrument have been tested in more than 400 research studies. Further information can be found at:

<http://www.pearsonassessments.com/tests/bsi.htm>.

Brief Battery for Health Improvement (BHI)

The BBHI 2 test was developed specifically to help medical professionals assess the important mind/body connection for their patients. Derived from the well-researched, widely used BHI™ (Battery for Health Improvement) test, the shorter BBHI 2 instrument helps practitioners quickly evaluate for a number of psychomedical factors commonly seen in medical patients, such as pain, somatic, and functional complaints – as well as traditional psychological concerns such as depression, anxiety and patient defensiveness. Further information can be obtained at: <http://www.pearsonassessments.com/tests/bbhi2.htm>.

Appendix A

Assessing and Treating Psychological and Behavioral (yellow flag) Risk Factors

It is important to remember that risk factors are often interrelated. This requires clinicians to use caution in treating them as if they were separate entities.²⁶ For example, certain risk factors may appear on the surface to be modifiable while complicating factors may in fact make them more difficult to address.²⁷ Take, for instance, functional disability. On the surface this appears to be a risk factor that could be improved by physical therapy. However, if there are other risk factors such as older age, emotional distress, and high job dissatisfaction that are contributing to the disability, then treatment will be inadequate if it does not attend to these underlying issues.

Because of the high co-morbidity associated with pain and disability, it is beneficial for clinicians to develop a collaborative approach to treatment. Early referral to multidisciplinary treatments such as vocational counseling, return-to-work rehabilitation, and/or cognitive-behavioral and preventive physical therapy intervention can be the key to addressing multiple risk factors and reducing long-term disability.

Treating Yellow Flag Risk Factors

1. Assessment and Treatment for Obesity

Assessment for overweight individuals (BMI 25.0-29.9)²⁸:

Diet: Preferably dietary assessment should be carried out by referral to a registered dietitian. If not practical, there are several brief tools, such as the MEDFICTS Dietary Assessment Questionnaire (see Resources), which can give some quick insight into the patient's dietary patterns.

Physical activity: Physical activity can be quickly assessed by a number of questionnaires including the Self-Administered 7-day Physical Activity Recall Questionnaire (see Resources).

Emotional status: Epidemiologic data suggest an association between obesity and depression^{29, 30}. Therefore, screening for depressive symptoms may be important in overweight individuals. Consider a screening tool such as the Beck Depression Inventory for Primary Care (BDI-PC). This is a self-administered questionnaire that helps to identify depressive symptoms (see resources). Another useful screening tool is the Battery for Health Improvement (BHI) that includes both psychological and functional scales (see Resources).

A positive screen for depression should prompt referral for further evaluation and diagnostic interview with a psychologist, psychiatrist or other qualified mental health practitioner.

Assess Readiness to change: The Transtheoretical Model^{31,32,33} is an integrative model of behavior change. The model describes how health care professionals can help individuals modify a problem behavior or acquire a positive behavior. The central organizing construct of the model is the Stages of Change where change is a process involving progress through a series of stages. Below is an example of the Stages of Change applied to assessment for weight loss and suggested intervention based upon the stage.

²⁶ Boersma K & Linton SJ 2005

²⁷ Turner J et al. 2000

²⁸ Marcus DA. 2004

²⁹ Simon GE et al. 2006

³⁰ Wyatt SB, Winters KP, Dubbert PM 2006

³¹ Prochaska & DiClemente, 1983

³² Prochaska, DiClemente, & Norcross, 1992

³³ Prochaska & Velicer, 1997

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Stage	Assessment	Intervention
PRECONTEMPLATION	Patient is not ready to change	Personalize risk factors; Discuss risk related to pain; Offer help; Provide written material; Arrange follow-up
CONTEMPLATION	Patient is concerned about weight	Assess diet, physical activity, emotional status; Discuss risk; Educate re: simple steps; Offer help; Provide written material; Arrange follow-up
PREPARATION	Patient has decided to do something about it but has not yet begun	Assess diet, physical activity, emotional status; Discuss risk; Educate re: simple steps; Provide counseling (see weight loss below); Arrange follow-up

- Discuss risk relationship of overweight and pain and disability:
 - CTS cases have a significant correlation with higher BMI³⁴
 - Weight is associated with co-morbid
 - Disability
 - Depression
 - Reduced quality of life for physical function in patients with pain
- Recommend Dietary changes:

One of the most efficacious diets for weight loss is a balanced, reduced calorie plan based on the United States Department of Agriculture (USDA) guidelines. See www.mypyramid.gov. A deficit of 500 to 1000 calories a day from ones typical caloric intake will result in a safe 1 to 2-pound weight loss a week.

Recent research comparing popular diets such as Atkins, Ornish, Weight Watchers and Zone³⁵ revealed that weight loss was associated with self-reported dietary adherence but not with diet type. For each diet, reduction in cholesterol, CRP and insulin were related to weight loss, with no significant difference among the diets.

The best approach may be to find 2 or 3 commercially available diets to recommend. What is important in terms of outcome is that the patient be able find a diet he or she can adhere to.

– Provide brief counseling^{36, 37}

Review food/physical activity records
Review goals from last visit
Review problems and solutions
Set realistic goals
Sign behavioral contract
Give positive feedback and encouragement

³⁴ Kouyoumdjian JA et al. 2000.

³⁵ Dansinger ML et al. 2005

³⁶ Poston WSC, Haddock CK, Pinkston MM, et al. 2004.

³⁷ Foreyt JP Weight Loss: Counseling and Long-Term Management

- Weight Loss Counseling Strategies
 - Set realistic goals
 - Help patients to set moderate realistic short-term goals such as making small increases in daily walking and decreases in portion sizes. Re-evaluate and revise at regular increments.
 - Self-monitoring
 - Ask patient to write down what they eat and look up the calories. This is critical to raising awareness. Ask the patient to write down the minutes they exercise or the number of steps a day if using a pedometer.
 - Consider meal replacements
 - Research documents that substituting 2 meals with a meal replacement for weight loss has been shown excellent efficacy with no significant safety concerns.
 - Stimulus control
 - Ask patients to identify the problems contributing to dietary and exercise lapses. Discuss ways to modify this behavior.
 - Managing stress
 - Recommending relaxation techniques and increasing physical activity can be helpful for patients with stressful lifestyles.
 - Cognitive restructuring
 - Recommend a cognitive-behavioral weight-loss program. This can help patients adopt self-enhancing, self-affirming rather than self-defeating thoughts and behaviors.
 - Relapse prevention
 - Relapses are a normal part of a weight-loss process. Counseling patients about how to deal with relapses includes helping them to understand that they can be expected and how to prepare for them.
 - Social support
 - Support is valuable for both weight loss and maintenance. Referral to a support group may be beneficial.
 - Contracts
 - Ask patients to verbalize at least 1 behavior change they agree to make over the next 2-3 weeks. Examples may be increase walking from 15 to 30 minutes, increase the number of days from 3 to 5 or limit desserts from 4 days a week to 2 days a week. Ask the patient to write the behavior change down and sign the contract.
- Pharmacological interventions³⁸:

The Clinical Evidence Handbook published in 2007 by the British Medical Journal has summarized effectiveness of drug treatments for obesity according to evidence of benefit.

³⁸ Arterburn, DeLeet, Schauer 2007

What are the effects of drug treatments in adults with obesity?		
Trade off between benefits and harms		<ul style="list-style-type: none"> • Diethylpropion • Mazindol • Orlistat • Phentermine • Rimonabant • Sibutramine
Unknown effectiveness		Sibutramine plus orlistat

Web publication date: 01 Aug 2006 (based on July 2005 search)

Diethylpropion, mazindol, orlistat, phentermine, rimonabant and sibutramine may promote modest weight loss (an additional 1 to 7 kg lost) compared with placebo in obese adults having lifestyle interventions, but they can all cause adverse effects.

- Diethylpropion, phentermine and mazindol have been associated with heart and lung problems in case reports and series.
- Sibutramine has been associated with cardiac arrhythmias and cardiac arrest in case reports.
- Orlistat may be less effective at promoting weight loss compared with sibutramine, although studies have shown contradictory results.
- The authors do not know whether combining orlistat and sibutramine treatment leads to greater weight loss than either treatment alone.

=>Clinicians unfamiliar with prescribing these medications should refer patients to clinicians specializing in the treatment of obesity.

Morbid obesity (BMI>40)

In adults with morbid obesity or with BMI > 35 with a serious obesity-related co-morbidity surgery is the most effective intervention for the production of weight loss. Patients should be referred to a reputable weight loss center for consultation and evaluation³⁹.

³⁹ Arterburn, DeLeet, Schauer 2007

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What are the effects of bariatric surgery in adults with morbid obesity?		
Likely to be beneficial		<p>Bariatric surgery (more effective than non-surgical treatment for clinically important weight loss in morbidly obese adults; but operative complications common)</p> <ul style="list-style-type: none"> • Gastric banding • Gastric bypass • Vertical banded gastroplasty
Unknown effectiveness		<p>Biliopancreatic diversion (no studies comparing biliopancreatic diversion versus other bariatric techniques)</p> <p>Sleeve gastrectomy (no studies comparing sleeve gastrectomy versus other bariatric techniques)</p>

Web publication date: 01 Aug 2006 (based on July 2005 search)

Bariatric surgery (vertical banded gastroplasty, gastric bypass or gastric banding) may increase weight loss compared with no surgery in morbidly obese people.

- Bariatric surgery may result in loss of over 20% of body weight, which may be largely maintained for 10 years.
- Operative and postoperative complications are common and up to 2% of people die within 30 days of surgery. However, surgery may reduce long term mortality compared with no surgery.
- The authors do not know which surgical technique is the most effective or least harmful.
- The authors do not know how biliopancreatic diversion or sleeve gastrectomy compares with other treatments.

2. Assessment and Treatment for Smoking Cessation

Assess tobacco use in all injured workers.

- For patients currently smoking > 10 cigarettes/day⁴⁰
 - **Advise** to quit smoking – “I strongly advise you to quit smoking and I can help you.”
 - **Advise** of overall health risk related to:

Although smoking is not significantly correlated with CTS rationale may be provided related to:

- Overall health risk and compromised recovery due to cigarette smoking enhancing sympathetic activity and vasoconstriction⁴¹.
- **Ask** every tobacco user if s/he is willing to make a quit attempt at this time
 - If willing to quit, provide assistance (see below)
 - If unwilling to quit, provide motivational intervention

QuitWorks is a free stop-smoking service offered to any Massachusetts patient (see Resources) provides a take-home pamphlet “Think About It”.

- **Assess** readiness to quit

⁴⁰ Adapted from Rigotti A 2004.

⁴¹ Adapted from Rigotti A 2004.

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Stage	Assessment	Intervention
PRECONTEMPLATION	Patient is not ready to change	Personalize risk factors; Discuss risk related to pain; Offer help; Provide written material (see Quitworks below); Arrange follow-up
CONTEMPLATION	Patient is concerned about smoking	Assess current tobacco use, Discuss risk; Educate re: simple steps; Offer help; Provide counseling (see smoking intervention below); Arrange follow-up
PREPARATION	Patient has decided to do something about it but has not yet begun	Assess current tobacco use, Discuss risk; Educate re: simple steps; Provide counseling (see smoking intervention below); Arrange follow-up

– **Assist** smokers in stopping

- Provide brief counseling
- Recommend use of pharmacotherapy (patch, gum, nasal spray, lozenge, inhaler, bupropion-SR) unless contraindicated⁴²
- **QuitWorks** provides clinicians with FDA recommendations for pharmacotherapy dosing.
- Enroll patient for **QuitWorks** services through the Try-To-STOP TOBACCO resource Center (see Resources)

Or

- Provide self-help material (see Resources)
- Develop a tapering program and plan to stop
- Identify triggers and brainstorm strategies
- Advise physical activity where appropriate

– **Arrange** follow-up within 1–2 weeks

- At subsequent visit, review quit status
- Congratulate success; encourage maintenance
- QuitWorks provides status report and a six-month follow-up report for every patient referred

If tobacco use has occurred:

– **Ask** for recommitment to total abstinence

- Review circumstances that caused lapse
- Use lapse as a learning experience
- Assess pharmacotherapy use and problems
- If willing to try again, re-enroll patient for QuitWorks services.

– **Arrange** follow-up visit

=>Refer to Resources for additional quit smoking information.

⁴² Brunnhuber K, et al. 2007 Both nicotine- and nonnicotine-based therapies can increase the chances of successful smoking cessation (Lam et al 2006). Nicotine-based therapies are available as transdermal patch, gum, nasal spray, inhaler, or lozenge. FDA-approved nonnicotine-based drug treatments include bupropion and varenicline.

3. Assessment and treatment for alcohol or drug abuse⁴³:

Alcohol is commonly overlooked as a risk factor and a cause of problems in the management of pain. Therefore, consumption should be a routine part of the assessment of patients in pain.⁴⁴ Some patients may attempt to use alcohol to self-medicate to treat pain, sleep disturbance, depression, anxiety or panic disorders.

Drug abuse is often a confusing assessment for clinicians treating patients with pain. When assessing drug use, clinicians must be familiar with the terminology. One of the most confusing distinctions is between physical dependence, which is a pharmacological feature of many drugs, and addiction, which is a biobehavioral syndrome evidenced by a person's interaction with a drug^{45,46}. Fear and desperation in the patient seeking relief and poor understanding of drug actions can often lead to improper drug use or drug misuse in the pain patient. Cultural factors also figure in this and it is imperative to do a thoughtful history and evaluation.

- Assess:
 - Consequences and problems due to drinking
 - **ASK:** "Has your use of alcohol or drugs ever caused a problem for you or your loved ones?"
 - Quantity/frequency of ETOH drinking related to established risk-levels
 - **ASK:** "How many glasses (ounces) of wine/beer/mixed drinks do you have a day?"

And/or

CAGE (AID) Screening Checklist for Possibility of Alcoholism

The CAGE (AID) Screen broadens the CAGE to include other drug use

CAGE (AID) Screen:

Have you ever:

- C:** felt you ought to cut down on your drinking or drug use?
- A:** had people annoy you by criticizing your drinking or drug use?
- G:** felt bad or guilty about your drinking or drug use?
- E:** had a drink or used drugs as an eye opener first thing in the morning to steady your nerves or get rid of a hangover or to get the day started?
 - If + CAGE (AID):
 - Flesh out the responses asking "why" and "how" questions. For instance:
 - Why did you try to cut down?
 - How do people's comments about your drinking or drug use annoy you?
 - These exploratory questions serve two purposes:
 - Diagnosis
 - Preparing for intervention
 - At risk drinking⁴⁷
 - Men >14 drinks/week or >4 drinks/occasion
 - Women of all ages and anyone >65 years of age: >7 drinks/week or >3 drinks/occasion

⁴³ Adapted from Bierer MF, 2004.

⁴⁴ Haddox JD 1998

⁴⁵ Haddox JD 1998

⁴⁶ Savage S et al. 2001

⁴⁷ National Institute on Alcohol Abuse and Alcoholism (NIAAA)

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- The Standard Drink (Standard Equivalent):
 - ~12-14 grams of pure ethanol
 - 5 oz wine
 - 12 oz beer
 - 1.5 oz distilled spirits (one shot)
 - Safe drinking
 - Moderate drinking: recommended maximum limits given no contraindications (e.g. depression, sleep apnea, seizures or reflux).
 - At risk drinking:
 - Above recommended maximum: NOT necessarily a “problem” but warrants further exploration and at least recommendation to drink at healthy levels
 - With negative consequences: “problematic drinking”: patient should decrease or stop
 - More severe: alcohol abuse
 - Most severe: dependence
 - Diagnosis
 - Alcohol dependence (Alcoholism)
 - Loss of control / inability to cut down
 - Use despite known negative consequences
 - Significant preoccupation and effort spent
 - Loss of major life role (s)
 - Optimally, patient needs to abstain; possibly taper or undergo medical detoxification
 - Consider Brief Intervention (See also Motivational Interviewing section below):
 - Share your thoughts
 - Be non-judgmental, supportive. This starts with the tenor of the questioning/history-gathering
 - Ask what the patient wants to do about this (potential) problem
 - Make clear recommendations and arrive at a clear next step (e.g. cutting down, quitting, trial of abstinence)
 - Arrange clear follow-up
 - Cardinal elements:
 - Raising awareness
 - Advising change
 - Arranging follow-up
- =>Refer to Resources for additional information
- If substance abuse is present or suspected, consider referral for chemical dependency assessment.
 - For patients with history of substance abuse or alcohol dependence resistant to brief intervention refer

⁴⁸ See definitions

to addiction specialist⁴⁸ (see Resources).

=> Consideration for the use of opiates in patients with a history of alcohol or drug abuse. (Also see “Special consideration for long-term opiate therapy in non-cancer related chronic pain” below)

- For those individuals with current or remote alcohol or drug abuse who may benefit from the therapeutic use of abusable drugs including the use of opioids to treat acute or chronic pain, monitoring of drug taking is crucial^{49,50}. Treatment requires a system for monitoring drug-taking behavior that is fitting for the apparent level of risk. If the abuse occurred in the distant past, the level of risk may be low. If the risk were high, a rigorous monitoring system would be essential.
- For those patients at high risk:
 - For the patient with chronic nonmalignant pain and substance abuse, there is neither a large and encouraging database of clinical experience nor empirical evidence that substantiate the safety and usefulness of opioid therapy⁵¹. Clinicians must exercise caution in recommending opioid treatment to such patients. Generally, the use of opiates for active substance abusers with chronic nonmalignant pain should not be initiated. Referral to an addiction specialist should be made (see resources) and collaboration with experienced clinicians who can provide skilled assessment and multidisciplinary treatment should provide treatment.
 - For patients with a remote history of significant abuse or addiction, only experienced clinicians who can provide skilled assessment and monitoring should provide treatment.
- A patient screening tool to assess risk potential for substance abuse can be found at:
 - <http://www.painedu.com/tools.asp>⁵²
- For those patients at low risk:
 - An evidenced-based protocol can be found at: http://www.oqp.med.va.gov/cpg/cot/ot_base.htm. This website includes a doctor-patient contract that is recommended when opioids are considered.

=>It is important to remember that patients who are not showing a meaningful response in terms of pain reduction and improved function and who cannot maintain compliance with therapy need to be proactively weaned from opioids.

4. Assessing and treating psychological risk factors

An overall idea of the most salient emotional aspects of pain can be elicited by posing a general question about the patient’s well-being, such as, “How has the pain affected your life?” or, “Can you tell me how you are coping with the pain problem and its effect on your life?”⁵³

- Depression and anxiety

Patients frequently express depressive mood, including feelings of worthlessness, bad temper, and self-criticism. Suicidal ideation is quite common in patients with chronic pain conditions^{54,55}. Every patient should be assessed for suicidal ideation and it should be addressed immediately.

The relationship of anxiety with chronic pain is well recognized both as a contributor to symptoms and a result of acute pain, persistent pain, and related disability.⁵⁶

⁴⁹ Lu HU et al. 1998

⁵⁰ Passik SD 2001

⁵¹ Menefee LA, Katz NP 2003

⁵² See VA/DoD [Veterans Administration/Department of Defense] CLINICAL PRACTICE GUIDELINE FOR THE MANAGEMENT OF OPIOID THERAPY FOR CHRONIC PAIN at http://www.oqp.med.va.gov/cpg/cot/ot_base.htm for an evidence-based guide. A patient screening tool (Screener and Opioid Assessment for Pain patients – SOAPP) to assess risk potential for substance abuse among patients can be found at <http://www.painedu.com/tools.asp>. (Butler, SF et al. 2004)

⁵³ Menefee LA, Katz NP 2003

⁵⁴ Haddox JD 1998

⁵⁵ Menefee LA, Katz NP 2003

⁵⁶ Kulich RJ & Baker WK 1998

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Warning signs for referral to a psychologist, psychiatrist or mental health professional are:

- Suicidal ideation
- Anergia (i.e. lack of energy)
- Persistent anhedonia (i.e., lack of pleasure)
- Loss of appetite
- Sleep disturbance
- Anxiety or panic
- Prolonged difficulty accepting the condition
- And angry outbursts toward self or others

There are self-report screening tools available to assist the surgeon, primary care or occupational health clinician in assessing the psychological aspects of pain. The most frequently used self-report measure of depression is the **Beck Depression Inventory (BDI)** (see resources below) and is often used in primary care settings as a brief screening instrument for affective disorders.

In addition, the **Battery for Health Improvement (BHI)** includes both psychological (anxiety and depression scales) and functional scales for use in a clinical setting (see resources).

A positive screen for depression should prompt referral for further evaluation and diagnostic interview with a psychologist, psychiatrist or other qualified mental health practitioner. Most importantly, suicidal thoughts should be taken seriously⁵⁷. Clinicians are encouraged to learn the laws in their state that apply to this circumstance. Do not hesitate to consult a mental health professional for advice or to arrange hospital admission. Every patient must be handled differently, because suicidal ideation does not inevitably signify a wish to die.

=>Important intervention for patients with suicidal plan:

Send immediately to nearest Emergency Room for evaluation, employ emergency response system, or advise patient, family or caregiver to employ emergency response system.

5. Assessing and treating physical trauma &/or emotional abuse or sexual assault

There is increasing consideration for the assessment of sexual assault and physical or emotional trauma with regard to chronic pain and disability⁵⁸. Data suggest a higher proportion of sexual abuse is found in chronic pain populations than in the general population, although a causal link has not been demonstrated⁵⁹. Case reports suggest that the effects of a history of abuse or trauma may predict a difficult treatment course and poor outcome. There appears to be support for adequate evaluation and appropriate psychotherapeutic treatment of individuals with this history in order to reduce suffering and differentiate past trauma from present work related trauma or procedure, and improve outcome.

- Screening for physical trauma &/or emotional abuse or sexual assault

ASK: “In your lifetime, have you been physically or sexually abused? Has anyone ever tried to pressure or force you to have unwanted sexual contact? (sexual contact: touching your sexual parts, you touching their sexual parts, or intercourse). Have you experienced physical trauma in your lifetime?”

- If significant physical or sexual abuse is reported, abuse counseling should be considered. (see Resources)

⁵⁷ Haddox JD 1998

⁵⁸ Kulich RJ & Baker WK 1998

⁵⁹ Linton SJ 1997

Opiate Use for Chronic Non-cancer Pain

The use of long-term opioids in chronic non-cancer pain remains controversial⁶⁰. Research on the use of opiate-based pain relievers, in what dose, for how long does not yet provide clear guidance for clinicians when prescribing for patients with non-cancer related chronic pain. A recent review of opiate therapy in chronic pain concluded that: "Whereas it was previously thought that unlimited dose escalation was at least safe, evidence now suggests that prolonged, high dose opioid therapy may be neither safe nor effective."⁶¹

Tolerance, or loss of analgesic effect over time, occurs in a number of patients, but prevalence is unknown. **Addiction**, which is the compulsive and self-destructive use of opiates, also may occur, but again with unknown frequency. As with all medications, the prescribing of opioids should be intended toward helping patients increase function and reduce pain perception. Side effects include constipation, sedation, nausea, irritability, and sweating, itching, and cognitive dysfunction. These should be aggressively managed; however, most will lessen in time in many patients.

Generally opiates are used in chronic pain conditions when other therapies have not been effective⁶². The pharmacologic treatment of chronic pain should proceed considering the goals of both pain reduction and restoration of function. Realistic goal-setting is an important part of initial communications with the patient in chronic pain. Unfortunately, patients with chronic pain rarely achieve complete relief; however, function and quality of life can often be enhanced through a combination of pharmacologic and non-pharmacologic therapies. Therefore, it is essential to help the patient set appropriate expectations: that pain relief will likely be partial but life can be greatly improved through pain management. Although primary care practitioners often manage opioids for patients with chronic pain, they should not hesitate to refer patients to psychiatry, psychology or pain management centers for consultation and/or evaluation and treatment.

It is imperative that clinicians become aware of the data related to opioid dosing trends and mortality rates, consider carefully before prescribing opiates for long-term use in patients with chronic non-cancer-related pain⁵⁶ and use and attend to the principles outlined in the guidelines below when choosing to prescribe.

- A patient screening tool to assess risk potential for substance abuse can be found at:
 - <http://www.painedu.com/tools.asp>⁶⁴
- For those patients at low risk:
 - An evidenced-based protocol can be found at: http://www.oqp.med.va.gov/cpg/cot/ot_base.htm.
This Website includes a doctor-patient contract that is recommended when opioids are considered.

=>It is important to remember that patients who are not showing a meaningful response in terms of pain reduction and improved function and who cannot maintain compliance with therapy need to be proactively weaned from opioids.

⁶⁰ Franklin GM et al. 2005

⁶¹ Ballantyne & Mao 2003

⁶² Menefee LA, Katz NP 2003

⁶³ Franklin GM et al. 2005

⁶⁴ See VA/DoD [Veterans Administration/Department of Defense] CLINICAL PRACTICE GUIDELINE FOR THE MANAGEMENT OF OPIOID THERAPY FOR CHRONIC PAIN at http://www.oqp.med.va.gov/cpg/cot/ot_base.htm for an evidence-based guide. A patient screening tool (Screener and Opioid Assessment for Pain patients – SOAPP) to assess risk potential for substance abuse among patients can be found at <http://www.painedu.com/tools.asp>. (Butler, SF et al. 2004).

Appendix B

Intensive Multidisciplinary Treatment Program

The purpose of an intensive short-term (8-10 week) treatment program is behavioral management of pain behaviors, risk factor reduction, and reduction of physical impairments. The work-injured patient/claimant suffering from delayed recovery and at high risk for chronic pain is often experiencing a number of physical and psycho-behavioral health issues including daily pain, weight gain, smoking, inactivity/deconditioning, and stress.

Treatment objectives should include:

- Reduction of physical discomfort
- Risk factor reduction
- Maximizing functional capacity
- Successful reintegration to workforce/prepare for retraining

A) Program Components should include all or most of the following:

- Cognitive strategies
 - Education
 - Goal setting
 - Relaxation techniques
 - Cognitive restructuring for stress management
- Behavioral strategies
 - Pacing activities
 - Social support
 - Progressive active physical therapy and exercise program
- Risk Factor Reduction (where appropriate) – required (or may refer to outside resource)
 - Smoking cessation
 - Weight reduction
 - Treatment for depressive symptoms
 - Physical abuse or sexual assault counseling
 - Alcohol or substance abuse counseling
- Pain Management
 - Pharmacological management (see recommendations section E)
 - There is limited evidence to indicate that splinting, laser-acupuncture, yoga, and therapeutic ultrasound may be effective in the short to medium term (up to 6 months). The evidence for nerve and tendon gliding exercises is even more tentative. However, it would be reasonable to try some of the techniques with less evidence if the better ones are not successful.

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- Physical Conditioning
 - Functional restoration
 - Offer at least one of the following or refer to outside resource:
 - Aquatherapy
 - Muscle group strengthening
 - Yoga

B) Evaluation must include:

Evaluation of the injured worker and development of a treatment plan by a multi-disciplinary treatment team, no member of which is a practitioner who has previously examined, ordered medical care for, rendered medical care to, or reviewed the medical records, of the injured employee

- Quantitative Measures must document:
 - Functional Capacity Evaluation (FCE) pre program
 - Attendance
 - Weight
 - FCE mid program
 - FCE post program
- Qualitative Measures must document:
 - Pain level (numeric rating scale (NRS) 0-10) Pre, Post and weekly
 - Pain location (see Pain Drawing Appendix B)
 - Effects of treatment on pain and function
 - Self-Efficacy of pain management Pre and post program (see Appendix D)
- Program Documentation must include:
 - Weekly SOAP (subjective, objective, assessment, plan) notes provided to Nurse Advocate
 - Weekly patient self-evaluation

C) Treatment Team

The treatment team to include a licensed mental health professional (either a psychiatrist or psychologist) and no more than three of the following: physician, advanced practice nurse/physician's assistant, physical therapist, and/or occupational therapist. At least one member of the treatment team should be a clinician who by virtue of training or experience is especially qualified to evaluate and treat chronic pain patients

A member from within the pain program/treatment team must be assigned to coordinate clinical care (a Program Coordinator). This person is to communicate and coordinate the treatment plan, goals and outcome measures with the patient's Nurse Advocate

D) Patient Contract

Within 7 calendar days of the initial evaluation for treatment under this guideline, a Patient Contract for, and an outline of a treatment plan.

- a. Non-compliance with the Patient Contract, as determined by the Program Coordinator, will result in immediate termination from the treatment program and this guideline.

Adapted from Commonwealth of Massachusetts Department of Industrial Accidents Treatment Guidelines. Downloaded from www.mass.gov/dia/hcsb/treatmentguidelines.htm September 10, 2004

E) Pharmacological Management

Consider trial on adjuvant medications such as tricyclic antidepressants, anticonvulsants or antispasmodics may be indicated for pain management (unless contraindicated) (see Reference for The Massachusetts General Hospital Handbook of Pain Management).

Appendix C

Minimum Components for Conservative Treatment Plan

There may be circumstances whereby patients are unable to be referred to or participate in an Intensive Multidisciplinary Pain Treatment Program. In those cases we recommend a minimum of the following conservative measures for those at high risk for compromised recovery:

- Education (see Resources)
- Physical/Occupational therapy (See I B2 above)
- Pain Management

- Pharmacological

Trial on adjuvant medications such as tricyclic antidepressants, anticonvulsants or antispasmodics may be indicated for pain management (see Reference for The Massachusetts General Hospital Handbook of Pain Management) (Weeks 4-12+).

- Non-pharmacological

There is limited evidence to indicate that splinting, laser-acupuncture, yoga, and therapeutic ultrasound may be effective in the short to medium term (up to 6 months). The evidence for nerve and tendon gliding exercises is even more tentative. However, it would be reasonable to try some of the techniques with less evidence if the better ones are not successful.

- Risk Factor Reduction
 - Smoking cessation
 - Weight reduction
 - Treatment for depressive symptoms
 - Physical abuse or sexual assault counseling
 - Treatment for alcohol or substance abuse
- Documentation must include:
 - Quantitative & Qualitative Measures
 - Communication with Case Manager/Advocate

Appendix D

Chronic Pain Self-efficacy Scale

The Chronic Pain Self-efficacy Scale measures the extent to which patients perceive their current ability to manage, function and cope with chronic pain. The 22-item questionnaire consists of three sub-scales: pain management (5 items); coping (8 items); and physical function (9 items). Responses to perceived ability (e.g., "How certain are you that you can...") to carry out the specified activity or achieve a specific outcome are recorded on a 10-point scale (by tens) from very uncertain (10) to very certain (100). A scale score is the mean response for that scale, and the total score is the sum of the scale scores. Validity has been supported in a variety of populations with satisfactory internal consistency reliability estimates ($\alpha = .90 - .91$) for the sub-scale and total scores.⁶⁵

⁶⁵ Anderson K et al. 1995

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Methods Used to Formulate Recommendations

Literature Review: Searches of Electronic Databases

Expert consensus: Development has taken place between members of the committee (nurse practitioner specializing in pain medicine, pharmacist, hand surgeons, and pain specialist).

Modifications to the pathway will undoubtedly be necessary as a result of new research and practice-based evidence.

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