

# Transplantation for Meniscal and Articular Cartilage Defects

Clinical Pathway for Work-Related Injury

**Revised Edition**

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# Meniscal and Articular Cartilage Defects

## Introduction

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This clinical pathway is intended to serve as an instructional aid. **It is designed for clinicians treating work-injured patients with meniscal and articular cartilage defects.** The policy attends to the procedures of autologous chondrocyte implantation (ACI), osteochondral allograft transplantation, osteochondral autograft transplantation (OATS/mosaicplasty), and meniscal allograft transplantation.

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. It is expected that a clinician 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 practitioner's experience. Treatment may differ from that outlined here.

## Working Group

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## Intended Users

### Physicians and allied health professionals

## 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, and
- A reduction in unnecessary costs associated with delayed recovery and inefficient resource utilization

## Patient Population

Adult injured workers 18 – 50 years with a meniscal or articular cartilage defect caused by a work-related trauma to the knee.

## Objectives

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

## Definitions

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**Articular cartilage:** a tough, spongy material that covers and protects the ends of bones and has limited repair capabilities.

**Arthroscopic surgical repair:** a surgical procedure utilizing a fiberoptic camera and instruments inserted into the joint to assess, and repair when indicated, with minimal invasiveness.

**Autologous Chondrocyte Implantation (ACI)** may treat patients with cartilaginous defects of the femoral condyle. Genzyme Tissue Repair developed a process termed Cartice<sup>TM</sup> to culture autologous chondrocytes. Physicians use an autologous chondrocyte implantation (ACI) for the repair of cartilaginous defects of the femoral condyle caused by trauma.

**The ACI process involves 2 separate and distinct procedures:**

First Stage: Arthroscopic surgery to assess the defect, perform chondroplasty or marrow stimulation procedure and obtain healthy chondrocyte cells from a patient's knee. The cells are then cultured through a process termed Cartice<sup>TM</sup>.

Second Stage: Open arthrotomy procedure to implant the cultured chondrocytes into the chondral defect and cover with a periosteal patch.

**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.

**Femoral condyle:** the end of the thighbone nearest the knee.

**“Kissing” lesion:** chondral lesion with a similar lesion on the opposite (mirror) side of the joint (i.e. femur and tibia).

**Meniscus:** Two cartilage cushions within the knee, lateral and medial, that provide cushioning to the knee and act as shock absorber.

**Marrow Stimulation Technique:** a process of drilling through the chondral defect or inserting picks through the defect to stimulate marrow cells to fill the defect for a fibrocartilage repair.

**Mosaicplasty:** a surgical procedure where one or several plugs of bone, along with its articular cartilage, is taken from one area of the knee of a patient and transplanted to another part of the knee on the same patient.

**Subchondral bone:** bone that lies directly underneath articular cartilage.

**Osteoarthritis:** a degenerative condition of the cartilage in the joints resulting in loss of motion and pain.

**Osteochondral autograft transplant (OATS):** a surgical procedure where one or several plugs of bone, along with its articular cartilage, is taken from one area of a patient and transplanted to another location on the same patient.

**Osteochondral allograft transplantation:** a surgical procedure where a portion of bone, along with its articular cartilage, is taken from another person and transplanted into the patient.

## Major Recommendations

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The following recommendations address the indications for autologous chondrocyte implantation (ACI), osteochondral autograft (OATS/mosaicplasty), and osteochondral allograft for the treatment of cartilaginous defects. The literature emphasizes the importance of proper patient selection.

These procedures are considered covered procedures for the repair of a cartilaginous lesion caused by an acute, work-related trauma to the knee. For example, the full-thickness cartilage loss is secondary to a shearing injury or a direct blow and when the following specific inclusion criteria are met:

**A. Autologous chondrocyte implantation (ACI)**, to treat cartilaginous defects of the knee is considered medically necessary when the following criteria are met<sup>1</sup>:

1. Response to prior non-surgical (e.g. minimum 2 months of physical therapy) AND surgical treatment (chondroplasty or a marrow stimulation technique) to correct the defect is insufficient;
2. Size of the cartilage defect is between 2.0 and 10 cm<sup>2</sup>;
  - Small cartilage defects are not likely to cause significant problems for patients and symptoms may improve without surgery.
  - The existing studies demonstrate good results in terms of decreased pain and improved physical function in patients with small to medium chondral defects with few therapeutic options.
3. No known history of allergy to the antibiotic Gentamicin or sensitivities to bovine cultures; Condition involves a focal, full thickness, (grade III or IV) isolated defect of the knee involving the weight bearing surface of the medial or lateral femoral condyles or trochlear region caused by acute or repetitive trauma.
4. There is less scientific information about other joints than the knee to determine whether health outcomes would be better with ACI. The FDA only approved the Carticel™ product for use on the part of the knee called the femoral condyle (medial, lateral, or trochlear aspects). If other parts of the knee are abnormal, the results of ACI on the femoral condyle may be affected.
5. In addition, **ALL** criteria listed in the “additional criteria for inclusion” section below are to be met.

**B. Osteochondral autograft transplantation**, either osteochondral autograft transplant (OATS) or mosaicplasty, to treat cartilaginous defects of the knee.

The medical literature regarding osteochondral autograft transplant (OATS) and mosaicplasty of the knee consists mostly of single-institution case studies centered on chondral lesions of the knee. However, there is a large collection of small studies demonstrating that osteochondral autografting procedures, including mosaicplasty confer significant benefit in terms of both functional improvement and pain relief in a population where alternative therapies are limited. It is considered medically necessary when **ALL** of the following criteria are met:

1. Size of the cartilage defect is between 1.0 to 2.5 cm<sup>2</sup> verified by arthroscopy;
  - Most recent evidence indicates that the larger the chondral defect, the higher the complication rate and rates of donor site morbidity. Therefore, at this time it may be appropriate to limit these procedures to small to moderate lesions, between 1.0 and 2.5 cm<sup>2</sup>, until further evidence is available.
2. Condition involves a focal, full thickness, (grade III or IV) isolated defect of the knee involving the weight bearing surface of the medial or lateral femoral condyles or trochlear region caused by acute or repetitive trauma;
3. In addition, **ALL** criteria listed in the “additional criteria for inclusion” section below are met.

<sup>1</sup> The favorable factors for ACI include younger patients with higher pre-operative modified Cincinnati scores, a less than two-year history of symptoms, a single defect, a defect on the trochlea or lateral femoral condyle and patients with fewer than two previous procedures on the index knee. Revision ACI-C in patients with previous ACI and mosaicplasties, which had failed, produced significantly inferior clinical results. Gender (p = 0.20) and the size of the defect (p 0.97) did not significantly influence the outcome. Krishnan SP et al. 2006.

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**C. Osteochondral allograft transplantation** to treat cartilaginous defects of the knee. The current medical literature regarding osteochondral allografting of the knee reveal that this procedure has demonstrated acceptable long-term results measured by reduction in pain, improved physical function, and sustained osteochondral graft viability. It is considered medically necessary when all of the following criteria are met:

1. Size of the cartilage defect is greater than or equal to 2.5 cm<sup>2</sup> verified by arthroscopy;
2. Condition involves a focal, full thickness, (grade III or IV) isolated defect of the weight bearing surface of the medial or lateral femoral condyles or trochlear region caused by acute or repetitive trauma;
3. In addition, **ALL** criteria listed in the “additional criteria for inclusion” section below are met.

**=> Osteochondral allograft transplantation is considered third line treatment and requires review prior to clearance for payment.**

## **Additional Criteria for Inclusion:**

*For all procedures listed above, **ALL** of the inclusion criteria listed below must be met:*

1. Age 50 years or less at time of surgery;
  - As people age, the articular cartilage thins due to age related changes. This reduces the chondrocyte viability and implant success.
2. Disabling persistent localized knee pain for at least four months, that has failed to respond to conservative treatment;
  - Symptoms such as pain or “locking” of the joint may improve on their own with time, or with nonoperative measures such as bracing, exercise, and activity modification.
3. A discrete, single and unipolar lesion involving only one side of the joint. (“Kissing lesions” are an exclusion);
4. An intact meniscus is present (i.e. A meniscus that is either uninjured or has had a partial meniscectomy involving less than 50% of the volume of the of the meniscus, or is an allograft meniscal transplant that has healed appropriate, or is being performed as a simultaneous procedure to the articular surface treatment).
5. Joint space is normal;
6. The lesion is largely contained with near normal surrounding articular cartilage and articulating cartilage, (grades 0, 1, 2);
7. The knee is stable, with normal alignment (corrective procedure may be performed in combination with or prior to transplantation);
  - If the ligaments and other structures in the knee are not stable, it is not possible to tell how much of the symptoms are related to the knee's instability rather than the cartilage problem. Unstable knees or knees with malalignment/misalignment may affect the results of the procedure.
8. No evidence of osteoarthritis present in the joint
  - Degenerative joint disease or osteoarthritis may not respond to this procedure. The FDA has not approved the Carticel™ product for this use.
9. No evidence of active infection is present
10. No history of cancer in the bones, cartilage, fat or muscle of the affected limb;
11. Body Mass Index (BMI) ≤35 (See Appendix A to assist patients with weight loss if necessary);
  - Practice-based evidence suggests that selected patients with BMI >35 may do well if the lesion is a small isolated defect involving the weight-bearing surface of the femoral condyle.
12. Mandatory smoking cessation (See Appendix B to assist patients with smoking cessation if necessary);

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– Clinical studies and experimental data show that smokers heal poorly. In addition, studies suggest an association between smoking and development of disability following meniscal injury.

13. Patient is willing and able to comply with post-operative weight-bearing restrictions and rehabilitation.

– Rehabilitation is a key element of successful treatment of cartilage defects with cell transplantation.

(See Reiger – Krugh et al. 2008 Table 1: Guidelines for ACI Rehabilitation. P 211-212.)

See attachments to this policy for each procedure listed above for guidance purposes.

## Physician requirements for ACI reimbursement:

Physicians must have completed the Genzyme Tissue Repair training course on ACI. In addition, they must have either:

- Performed or assisted on 5 or more ACI procedures.

OR

- Performed ACI under the direct supervision and control of a surgeon who has performed 5 or more ACI procedures.

Payment authorization for ACI is based upon the Insurer's understanding that only surgeons meeting the stated criteria will perform the procedure.

## Required documentation:

The Insurer may require the physician to submit the following documents to describe the patient's knee condition.

- Operative notes
- Radiographic Studies: Including: Reports of standing X-rays, MRI results.
- Arthroscopy photos and/or videos

## **D. Meniscal allograft transplantation is a procedure where a donor meniscus is surgically grafted into the knee of a patient.**

Patients who have undergone subtotal or total meniscectomy may benefit from meniscal allograft transplantation as the replacement meniscus may restore joint stability, load bearing, and shock absorption. In addition, the procedure may help to reduce the risk of osteoarthritis since there can be a reduction of stress on the tibial plateau. Short and mid-term studies have demonstrated the effectiveness of this procedure in alleviating pain and swelling and in improving knee function in carefully selected patients.

Meniscal allograft transplantation in one or more compartments is a covered procedure if the patient and the affected area meet ALL of the following inclusion criteria.

1. An acute, work-related trauma to the knee previously caused the need for a meniscectomy that removed at least two-thirds of the meniscus, or a radial tear that has extended to the capsular rim.
  - Loss of the meniscus either in part or whole, can have a poor prognosis in the long term, with the likelihood of future arthritis thought to be proportional to the amount of tissue that is torn or removed.
  - A radial tear will compromise all of the hoop stresses of the meniscus and render it non functional for load bearing.
2. The patient's knee pain has not responded to conservative treatment.
3. The articular cartilage in the affected compartment demonstrates a chondrosis classified as Grade I, II, or III. If Grade III, then debridement must first produce an articular surface sufficiently free of irregularities in order to maintain the integrity of the transplanted meniscus.

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4. Evidence shows that the knee is stable and has:
  - a. Sufficient articular cartilage in the affected compartment to ensure the continued integrity of the allograft meniscus, and
    - i. Intact ligaments, and
    - ii. Normal alignment, and
    - iii. Normal joint space.

AND

  - b. The patient meets ALL the following characteristics:
    - i. Too young or active for arthroplasty (the ideal patient age ranges from 20 to 45 years),
    - ii. Body Mass Index <35 (See Appendix A to assist patients with weight loss if necessary)
    - iii. Smoking cessation is mandatory (See Appendix B to assist patients with smoking if necessary)

## **Physician requirements for meniscal allograft transplantation reimbursement:**

Physicians must have:

- Performed or assisted on 5 or more meniscal allograft transplant procedures.

OR

- Performed the meniscal allograft transplant under the direct supervision and control of a surgeon who has performed 5 or more meniscal allograft transplant procedures.

Payment authorization is based upon the insurer's understanding that only surgeons meeting the stated criteria will perform the procedure.

## **Required Documentation**

The insurer may require physicians to submit the following documents to determine the patient's knee condition:

- Operative notes
- Reports of standing, anterior-posterior, and load bearing X-rays
- Reports of technetium bone scan
- Arthroscopy photos and/or videos
- Reports of computerized tomography (CT) scans
- Magnetic resonance (MR) evaluation results

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## Appendix A

### Assessment and Treatment for Obesity

Assessment for overweight individuals (BMI 25.0-29.9):

**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. 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 is an integrative model of behavior change. The model describes how people can 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:

Stage	Assessment	Intervention
<b>PRECONTEMPLATION</b>	Patient is not ready to change	Personalize risk factors; Discuss risk related to pain; Offer help; Provide written material; Arrange follow-up
<b>CONTEMPLATION</b>	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
<b>PREPARATION</b>	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:

- Weight is associated with co-morbid
  - Disability,
  - Depression and
  - Reduced quality of life for physical function in patients with pain.

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## • 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](http://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 Zone 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

- 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

## • 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.

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## Pharmacological interventions<sup>2</sup>:

*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.

What are the effects of drug treatments in adults with obesity?		
Trade off between benefits and harms		<ul style="list-style-type: none"> <li>• Diethylpropion</li> <li>• Mazindol</li> <li>• Orlistat</li> <li>• Phentermine</li> <li>• Rimonabant</li> <li>• Sibutramine</li> </ul>
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>35)**

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 evaluation.

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

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

<sup>2</sup> Arterburn, Deleet, Schauer 2007

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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.

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## Appendix B

### Assessment and Treatment for Smoking Cessation

- **Assess** tobacco use in all injured workers.
  - For patients currently smoking > 10 cigarettes/day
- **Advise** to quit smoking. “I strongly advise you to quit smoking and I can help you.”
- **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** a free stop-smoking service offered to any Massachusetts patient (see resources) provides a take-home pamphlet “Think About It”

- **Assess** readiness to quit.

Stage	Assessment	Intervention
<b>PRECONTEMPLATION</b>	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
<b>CONTEMPLATION</b>	Patient is concerned about smoking	Assess current tobacco use, Discuss risk; Educate re: simple steps; Offer help; Provide written material (see QuitWorks below): Arrange follow-up
<b>PREPARATION</b>	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 contraindicated<sup>3</sup>.
    - Recommend use of pharmacotherapy (patch, gum, nasal spray, inhaler, bupropion-SR) unless contraindicated.
    - 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

<sup>3</sup> 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.

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- **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**

## Resources

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### Patient Information

#### **American Physical Therapy Association**

1111 N. Fairfax Street, Alexandria, VA 22314  
(800) 999-APTA(2782)  
<http://www.apta.org>

#### **Arthritis Foundation**

1330 Peach Tree Street, Atlanta, GA 30309  
(404) 872-7100  
(800) 283-7800 or call your local chapter (listed in the local telephone directory)  
<http://www.arthritis.org>

#### **American College of Rheumatology/Association of Rheumatology Health Professionals**

60 Executive Park South, Suite 150  
Atlanta, GA 30329  
(404) 633-3777, Fax: (404) 633-1870  
<http://www.rheumatology.org>

#### **National Arthritis and Musculoskeletal and Skin Diseases Information Clearinghouse (NAMSIC)**

National Institutes of Health  
1 AMS Circle, Bethesda, MD 20892-3675  
Phone: (301) 495-4484, TTY: (301) 565-2966  
Automated faxback system: (301) 881-2731  
<http://www.nih.gov/niams>

### 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>

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## 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  
(877) 946-4627

## 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-

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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>

## **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

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

### **National Cancer Institute**

<http://cancer.gov>

or call 1-800-4-CANCER

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## Methods Used to Formulate Recommendations

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**Literature Review:** Searches of Electronic Databases

**Expert consensus:** Development has taken place between members of the committee (nurse practitioner specializing in pain medicine, orthopedic 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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# Meniscal and Articular Cartilage Defects

## Attachment A

*This form is a guide for collecting pertinent data; use is optional.*

### AUTOLOGOUS CHONDROCYTE TRANSPLANTATION OF THE KNEE

PATIENT NAME \_\_\_\_\_

REQUESTING PHYSICIAN \_\_\_\_\_

OFFICE TELEPHONE NUMBER \_\_\_\_\_

1. Has the patient had symptoms for >6 months?  Yes  No
2. Size of the cartilage defect is between 2 and 10 cm<sup>2</sup>.  Yes  No
3. The lesion is full thickness, Grade III or IV, isolated to the femoral condyle, and discrete, single and unipolar.  Yes  No
4. Is there bone involvement?  Yes  No
5. Normal joint alignment is documented on x-rays?  Yes  No
6. Is osteoarthritis present in the knee?  Yes  No
7. There is absence of:
  - "Kissing Lesions"
  - Inflammation or infection
  - Total meniscectomy or abnormal meniscus
  - Allergy to Gentamicin or bovine cultures
8. The patient has BMI <35.  Yes  No
9. The patient does not smoke.  Yes  No
10. The patient is willing to comply with post-operative weight-bearing restrictions and rehabilitation.  Yes  No
11. The surgeon has completed the Genzyme Tissue Repair Surgeons Training Program.  Yes  No
12. If the answer to 11 is "No," how many surgeries has the surgeon performed/assisted in? \_\_\_\_\_

# Meniscal and Articular Cartilage Defects

## Attachment B

*This form is a guide for collecting pertinent data; use is optional*

### OSTEOCHONDRAL ALLOGRAFT TRANSPLANTATION OF THE KNEE

PATIENT NAME \_\_\_\_\_

REQUESTING PHYSICIAN \_\_\_\_\_

OFFICE TELEPHONE NUMBER \_\_\_\_\_

1. The patient is <50 years of age.  Yes  No
2. Size of the cartilage defect is >2.5 cm<sup>2</sup>.  Yes  No
3. The lesion is full thickness, Grade III or IV, discrete, single and unipolar.  Yes  No
4. Normal joint alignment is documented on x-rays.  
If no, corrective procedure is to be performed?  Yes  No  
 Yes  No
5. Is osteoarthritis present in the knee?  Yes  No
6. There is absence of:
  - "Kissing Lesions"
  - Inflammation or infection
  - Total meniscectomy or abnormal meniscus
7. The patient has BMI <35.  Yes  No
8. The patient does not smoke.  Yes  No
9. The patient is willing to comply with post-operative weight-bearing restrictions and rehabilitation.  Yes  No

# Meniscal and Articular Cartilage Defects

## Attachment C

*This form is a guide for collecting pertinent data; use is optional.*

### OSTEOCHONDRAL AUTOGRAFT TRANSPLANTATION OF THE KNEE

PATIENT NAME \_\_\_\_\_

REQUESTING PHYSICIAN \_\_\_\_\_

OFFICE TELEPHONE NUMBER \_\_\_\_\_

1. The patient is <50 years of age.  Yes  No
2. Size of the cartilage defect is 1.0 - 2.5 cm<sup>2</sup>.  Yes  No
3. The lesion is full thickness, Grade III or IV, discrete, single and unipolar.  Yes  No
4. Normal joint alignment is documented on x-rays.  Yes  No
- If no, corrective procedure is to be performed?  Yes  No
5. Is osteoarthritis present in the knee?  Yes  No
6. There is absence of:
  - "Kissing Lesions"
  - Inflammation or infection
  - Total menisectomy or abnormal meniscus
7. The patient has BMI <35.  Yes  No
8. The patient does not smoke.  Yes  No
9. The patient is willing to comply with post-operative weight-bearing restrictions and rehabilitation.  Yes  No

# Meniscal and Articular Cartilage Defects

## Attachment D

*This form is a guide for collecting pertinent data; use is optional.*

### MENISCAL ALLOGRAFT TRANSPLANTATION OF THE KNEE

PATIENT NAME \_\_\_\_\_

REQUESTING PHYSICIAN \_\_\_\_\_

OFFICE TELEPHONE NUMBER \_\_\_\_\_

1. The patient is between 20 - 45 years of age.  Yes  No
2. Trauma has previously caused the need for a meniscectomy that removed at least two-thirds of the meniscus.  Yes  No
3. The articular cartilage demonstrates a Grade I or II chondrosis.  Yes  No
4. The knee is stable and has:
  - Sufficient articular cartilage in the affected compartment
  - Intact ligaments
  - Normal alignment
  - Normal joint space
5. The patient has BMI <35.  Yes  No
6. The patient does not smoke.  Yes  No
7. The patient is willing to comply with post-operative weight-bearing restrictions and rehabilitation.  Yes  No
8. The surgeon has performed >5 meniscal allograft transplant procedures.  Yes  No