



OA Prevention

Osteoarthritis Prevention and
Management in Primary Care

OA

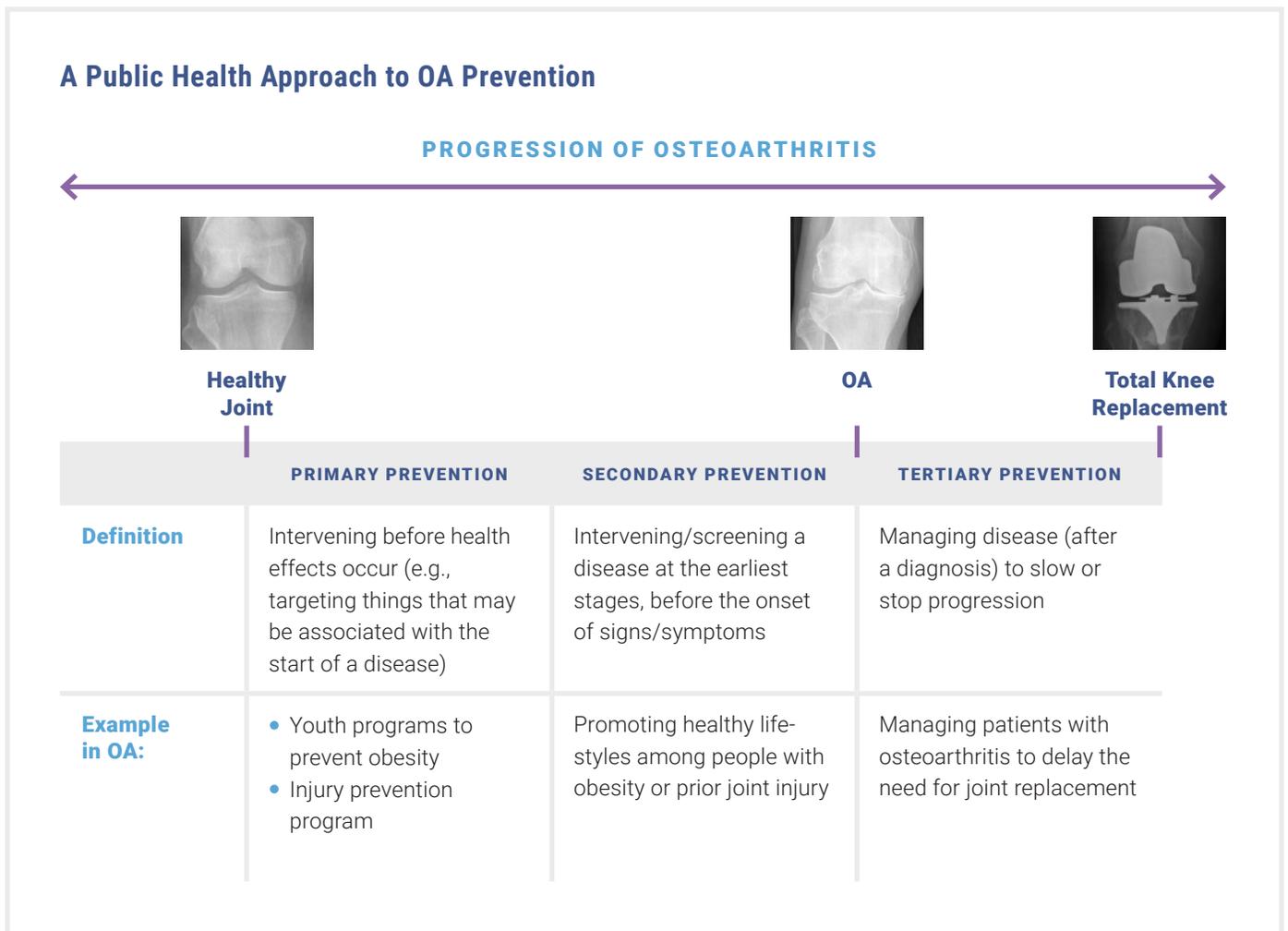
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OA Prevention

The field of public health focuses on disease prevention through three levels of activities: primary prevention (intervening before health effects occur), secondary prevention (intervening in early stages of a disease, before the onset of symptoms), and tertiary prevention (managing the disease to slow the progression, which is covered in the Clinical Management of OA module).¹ Injury prevention and weight management strategies span these three levels of activities in the context of preventing os-

teoarthritis (OA). This module takes a public health approach to primary and secondary prevention of OA through focusing on weight management and injury prevention strategies.

Injury prevention and weight management strategies may prevent symptomatic OA from occurring and have the potential to preserve wellness and quality of life for individuals and reduce the national burden of OA.²



Primary Prevention

WEIGHT MANAGEMENT

Clinicians should encourage individuals with a normal body weight to maintain or adopt a healthy lifestyle that involves physical activity and healthy diet to help preserve a normal body weight. Higher body mass index (BMI) is not only a major risk factor for diabetes, cardiovascular disease, cancer and premature death but is also implicated as a cause of OA.³ Excess weight increases the biomechanical load on weight-bearing joints, which can disrupt joint integrity and lead to pain.

Clinicians should focus on obesity prevention among all age groups, including children, by promoting healthy individual level behaviors. These behaviors may include reducing sugary drink consumption, reducing screen time and other inactive behaviors, increasing physical activity, and choosing food options low in solid fats, calories, and added sugars.⁴ Clinicians can also work with communities to promote the availability of healthy options for eating, physical activity in school, and accessible areas to be physically active in a community.⁵

INJURY PREVENTION

Injuries resulting from occupational activities, sports, or accidental falls, are known to be risk factors for subsequent OA development. Previous traumatic joint injury (e.g., a fracture) places someone at higher risk of developing OA in the affected joint(s). Post-traumatic OA makes up approximately 12% of all OA cases and can result from injuries sustained in automobile or military accidents, falls, or sports.⁶ Someone with a history of a previously torn anterior cruciate ligament (ACL) or meniscus is 2.5 times more likely to develop knee OA and four times more likely to undergo an eventual total knee arthroplasty.⁷⁻⁹

FALLS PREVENTION RESOURCES

Patients at risk of falling can build strength and improve balance to reduce their risk of fall-related joint injuries and should be counseled to engage in or increase their physical activity.

The **CDC's** STEADI initiative (Stopping Elderly Accidents, Deaths, & Injuries) includes educational materials for providers and handouts for patients on preventing falls.

The National Council on Aging's Falls Prevention Resource Center offers resources and handouts for providers and patients.

WEIGHT MANAGEMENT RESOURCES

The Centers for Disease Control and Prevention (CDC) developed resources to promote individual-level and community-level efforts to prevent and manage obesity.

Resources for individuals: Printable handouts for patients include tips on fruits and vegetables, portion size, healthy beverages, and more.

Community efforts: Community efforts should focus on policies and programs to support healthy eating and active living in a variety of settings such as early childhood care, hospitals, schools, and food service.

The Obesity Action Coalition (OAC) is a patient advocacy organization that offers a wide variety of brochures, guides and fact sheets on obesity and related topics including osteoarthritis.

Within the first decade after an ACL injury about 1 in 3 patients have radiographic OA, regardless of initial treatment strategy.^{10,11} Furthermore, surgical reconstruction and rehabilitation do not mitigate the risk of developing OA following ACL injury.¹²

Although injuries are not always avoidable, it pays to protect joints. All providers, especially those who regularly interact with athletes and sports enthusiasts, such as athletic trainers, physical therapists, sports medicine physicians, and fitness professionals, can advise patients or clients on the importance of wearing protective gear, like braces to prevent re-injury.¹³ In addition, participating in neuromuscular training exercises can reduce the risk for traumatic knee injury by up to 80%.¹⁴

Injury prevention activities such as stretching and strengthening exercises can be implemented in all levels of sports – from youth to professional levels – to protect athletes’ joints. Based on a comprehensive review of the literature, the OAAA Injury Prevention working group recommends that the following six core components (+ 2 optional components) be included in a structured warm-up during athletic practices to maximize effectiveness of lower limb injury prevention programs (LLIPP) for youth athletes.¹⁴ Handouts for athletic trainers, coaches, athletes and parents can be found on the OAAA website.

1. Lower extremity and core muscle strength training
2. Plyometrics – Jump Training
3. Balance exercises
4. Continual feedback to athletes regarding proper technique, including reminders to bend at knees and hips, to land softly, to keep knees over toes, and to avoid dynamic knee valgus
5. Sufficient dosing: For optimal results from a LLIPP, a minimum of 6 weeks (about 2–3 fifteen minute sessions per week) is suggested as pre-season conditioning after which time the program should be used as a warm-up before practices and games for in-season maintenance.
6. Minimal-to-no additional equipment is required. A mat for some of the exercises is desirable but not necessary.

OPTIONAL COMPONENTS:

7. Stretching: There is not enough evidence to support static stretching in ACL injury prevention. Dynamic stretching may be beneficial for other reasons, including perceptions about flexibility exercises being a critical aspect of warm-up activities, but additional research is needed to understand how stretching influences risk for ACL injury.
8. Agility exercises: There is not enough evidence to support agility exercises in ACL injury prevention; although, the addition of this component creates an opportunity to add sport-specific training.¹⁴

While time constraints are a commonly reported barrier to implementing injury prevention programs,^{15,16} many organizations deploy warm-up activities that embrace some of the core components and only need minor adjustments to adopt a successful injury prevention program for their setting.

Osteoarthritis: Staying in the game is a 'joint' effort!

The Osteoarthritis Action Alliance: ACL & Lower Limb Injury Prevention Task Force

- Osteoarthritis (OA) is a joint disease in which protective cartilage breaks down and wears away, allowing bones to rub together.
- Over time OA of the knee can make physical activities, such as walking, difficult and can significantly limit one’s quality of life.
- Many treatments, including operative and non-operative options, exist for treating OA.



IMPACT NUMBERS
 OA affects approximately
30+ Million
 U.S. adults.

INJURIES
 Individuals with history of knee injury are
3-6x
 more likely than those without history of knee injury to develop signs of OA.

DOWN THE LINE
 Up to
50%
 of individuals with an ACL injury will develop knee OA within 10-15 years.

KEEP ATHLETES ACTIVE
 Neuromuscular training exercises can reduce the risk for ACL and other traumatic knee injuries by up to
80%

The Task Force identified 7 core components of neuromuscular training

- Lower extremity & core strengthening
- Plyometric jump training
- Balance training
- Attention to participant compliance
- Minimal or no equipment needed
- Consistent feedback on proper technique
- Appropriate Dosage: minimum of 15 sessions over 6 weeks (2-3x/week) for at least 15 minutes per session



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Secondary Prevention

WEIGHT MANAGEMENT

Clinicians should encourage individuals who are overweight or obese without symptomatic OA to lose weight. A 10-pound weight loss in someone who is overweight can reduce the risk of knee OA by 50%.¹⁷

Weight loss counseling is a key component to successful weight loss in patients. The CDC reports that adults with arthritis who are overweight or obese and who receive provider counseling about weight loss are four times more likely to attempt to lose weight; yet, fewer than half of those adults are receiving such counseling.¹⁸ Healthcare providers can engage patients in weight loss counseling with successful strategies such as Motivational Interviewing and the 5As of Obesity Management¹⁹ to better advise and assist the patient, guide the patient to programmatic resources, and simply educate patients that even a small amount of weight loss can significantly reduce joint load and pain but is also achievable.²⁰ See Engaging Patients in OA Management Strategies module for more counseling strategies.

Many tips and resources about weight loss for patients can be found on the Obesity Action Coalition (OAC) website. The OAC is a patient advocacy organization that offers a wide variety of brochures, guides and fact sheets on obesity and related topics including osteoarthritis.²¹

INJURY PREVENTION

There is a critical need to develop, disseminate, and implement secondary prevention strategies to help patients after an initial injury.^{22,23} Secondary prevention strategies after a joint injury may include education, self-management, low-impact aerobic exercise, weight management, and prevention of a new joint injury (see section above). Injury prevention is particularly relevant for patients with a history of injury because a prior injury is a risk factor for a new injury.^{24,25} Furthermore, encouraging physically active individuals who are obese or overweight to participate in injury prevention training programs may be beneficial as they are at greater risk for injury than peers with a lower body mass index.^{26,27}

5 As of Obesity Management^{19, 28}

ASK

- Would it be OK if we talk about your weight?
- Do you have any concerns or questions about your weight?
- On a scale of 0 to 10, how important is it for you to lose weight?
- On a scale of 0 to 10, how confident are you that you can lose weight?

ASSESS

- Determine patient's stage and level of obesity
- Review patient's history and records to help determine underlying causes
- Ask patient questions about diet, sleep, physical activity habits, and emotional health (depression, addiction, trauma, etc)

ADVISE

- Discuss with patient the risks of excess weight
- Discuss with patient the benefits of losing weight
- Offer options of weight loss strategies (increased physical activity, nutrition counseling, food journal, sleep hygiene, surgery, etc)

AGREE

- Help patient set realistic goals based on patient's preferences and abilities
- Using SMART goals, help patient develop a weight loss plan

ASSIST

- Help patient think through potential challenges and personal supports
- Refer patient to other professionals (mental health, dietitian, PT, etc)
- Refer patient to community-based health programs
- Make a plan to follow up with patient at a specific time point



Clinical Take-Home Points

- Primary and secondary prevention efforts can have a dramatic impact on preserving wellness and quality of life of patients and reduce the national burden of OA.
- Clinicians should use the 5As and other motivational interviewing techniques to discuss the importance of weight management strategies among patients at risk for obesity or with obesity.
- Small changes in weight may profoundly alter the risk of OA.
- Clinicians should advocate for the use of injury prevention programs at local companies and organizations (e.g., youth athletic leagues, schools with athletic team).
- Injury prevention programs can reduce the risk for knee injury by up to 80%, which helps preserve a young adult's quality of life and can save communities significant costs (e.g., lost time from work, cost of medical care).

RESOURCES FOR PROVIDERS

- National Athletic Trainers' Association Position Statement: Prevention of Anterior Cruciate Ligament Injury (Padua DA, DiStefano LJ, Hewett TE, et al. National Athletic Trainers' Association Position Statement: Prevention of Anterior Cruciate Ligament Injury. *Journal of Athletic Training*. 2018;53(1):5–19.) https://www.nata.org/sites/default/files/prevention_of_anterior_cruciate_ligament_acl_injury_position_statement.pdf
- Athletic Trainers' Osteoarthritis Consortium: The Role of Athletic Trainers in Preventing and Managing Posttraumatic Osteoarthritis in Physically Active Populations: a Consensus Statement of the Athletic Trainers' Osteoarthritis Consortium (Palmieri-Smith RM, Cameron KL, DiStefano LJ, et al. The Role of Athletic Trainers in Preventing and Managing Posttraumatic Osteoarthritis in Physically Active Populations: a Consensus Statement of the Athletic Trainers' Osteoarthritis Consortium. *Journal of Athletic Training*. 2017;52(6):610–623.) <https://natajournals.org/doi/full/10.4085/1062-6050-52.2.04>
- Academy of Orthopaedic Physical Therapy and American Academy of Sports Physical Therapy: Clinical Practice Guidelines for Exercise-Based Knee and Anterior Cruciate Ligament Injury Prevention (Arundale AJH, Bizzini M, Giordano A, et al. Exercise-Based Knee and Anterior Cruciate Ligament Injury Prevention. *Journal of Orthopaedic & Sports Physical Therapy*. 2018;48(9):A1–A42.) <https://www.jospt.org/doi/10.2519/jospt.2018.0303>
- Diagnosis, treatment and prevention of ankle sprains: update of an evidence-based clinical guideline (Vuurberg G, Hoorntje A, Wink LM, et al. Diagnosis, treatment and prevention of ankle sprains: update of an evidence-based clinical guideline. *British Journal of Sports Medicine*. 2018;52(15):956–956.) <https://bjsm.bmj.com/content/52/15/956>
- 2018 International Olympic Committee Consensus statement on prevention, diagnosis and management of paediatric anterior cruciate ligament (ACL) injuries (Ardern CL, Ekås G, Grindem H, et al. 2018 International Olympic Committee consensus statement on prevention, diagnosis and management of paediatric anterior cruciate ligament (ACL) injuries. *Knee Surgery, Sports Traumatology, Arthroscopy*. 2018;26(4):989–1010.) <https://link.springer.com/content/pdf/10.1007%2Fs00167-018-4865-y.pdf>
- OAAA Consensus Opinion on Lower Limb Injury Prevention Programs: Recommendations for Essential Injury Prevention Program Components and Executive Summary https://oaaction.unc.edu/files/2018/08/FINAL_Consensus-Opinion_LLI-Prevention-Programs-Trojan-kra1.pdf
- Selected Issues in Injury and Illness Prevention and the Team Physician: A Consensus Statement (Selected Issues in Injury and Illness Prevention and the Team Physician: A Consensus Statement. *Medicine & Science in Sports & Exercise*. 2016;48(1):159–171.) https://journals.lww.com/acsm-msse/Fulltext/2016/01000/Selected_Issues_in_Injury_and_Illness_Prevention.21.aspx
- National Athletic Trainers' Association Position Statement: Conservative Management and Prevention of Ankle Sprains in Athletes (Kaminski TW, Hertel J, Amendola N, et al. National Athletic Trainers' Association position statement: conservative management and prevention of ankle sprains in athletes. *J Athl Train*. 2013;48(4):528–545. doi:10.4085/1062-6050-48.4.02) <https://natajournals.org/doi/pdf/10.4085/1062-6050-48.4.02>

PATIENT RESOURCES

- The Centers for Disease Control and Prevention (CDC) developed resources to promote individual-level and community-level efforts to prevent and manage obesity. Printable handouts for patients include tips on fruits and vegetables, portion size, healthy beverages, and more.

<https://www.cdc.gov/obesity/resources/factsheets.html>

- The Obesity Action Coalition (OAC) is a patient advocacy organization that offers a wide variety of brochures, guides and fact sheets on obesity and related topics including osteoarthritis.

Excess Weight and Your Health – A Guide to Effective, Healthy Weight Loss

[obesityaction.org/get-educated/public-resources/brochures-guides/excess-weight-and-your-health-a-guide-to-effective-healthy-weight-loss](https://www.obesityaction.org/get-educated/public-resources/brochures-guides/excess-weight-and-your-health-a-guide-to-effective-healthy-weight-loss)

Obesity and Osteoarthritis Fact Sheet

<https://4617c1smqldcqsat27z78x17-wpengine.netdna-ssl.com/wp-content/uploads/Obesity-and-Osteoarthritis-Fact-Sheet.pdf>

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