

2010

# Aging, Physical Activity and Arthritis Part 1

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## Citation of this paper:

Taylor, Albert W., "Aging, Physical Activity and Arthritis Part 1" (2010). *Canadian Centre for Activity and Aging Presentations*. 1.  
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**Canadian Centre for  
Activity and Aging**  
*from research to action* ●●●

# **Aging, Physical Activity and Arthritis**

*Living a Quality Lifestyle with Osteoarthritis,  
through Active Living*

Taryn-Lise Taylor, Catherine E. Casey, Edward Todd Taylor and Albert W. Taylor

Presented by : AW Taylor



## Presentation Overview

- What is Arthritis?
- 5 Major Types of Arthritis
- In-Depth Look at Osteoarthritis
- Medical Management of OA
- Healthy Aging with Arthritis through P.A.

# Arthritis

- Group of disorders affecting components of the musculoskeletal system
- Term meaning inflammation of the joint
- More than 100 different conditions
- Influenced by genetic factors

# Arthritis

Affects men and women equally however it affects them differently

Men	<ul style="list-style-type: none"><li>• Hips, wrists, and spines</li></ul>
Women	<ul style="list-style-type: none"><li>• Hands, knees, ankles, and feet</li><li>• Experience symptoms in more than one joint</li></ul>

# Risk Factors

## Along with natural aging

- Excess weight
- Injury and complications from diseases
- Genetic/Hereditiy
- Immune system abnormalities
- Lack of physical activity

## Major Types of Arthritis

1. Osteoarthritis (OA) → **most common**
2. Rheumatoid Arthritis (RA)
3. Systemic Lupus Erythematosus (SLE)
4. Ankylosing Spondylitis (AS)
5. Gout



Rheumatoid Arthritis

# Rheumatoid Arthritis

- Body's immune system attacking the body joints
- Leads to pain and inflammation and joint damage
- 1% of Canadian adults





# Systemic Lupus Erythematosus

- Connective tissue disorder causing skin rashes, joint and muscle swelling and pain
- Affects 0.05% of adults
- 10x more likely in women

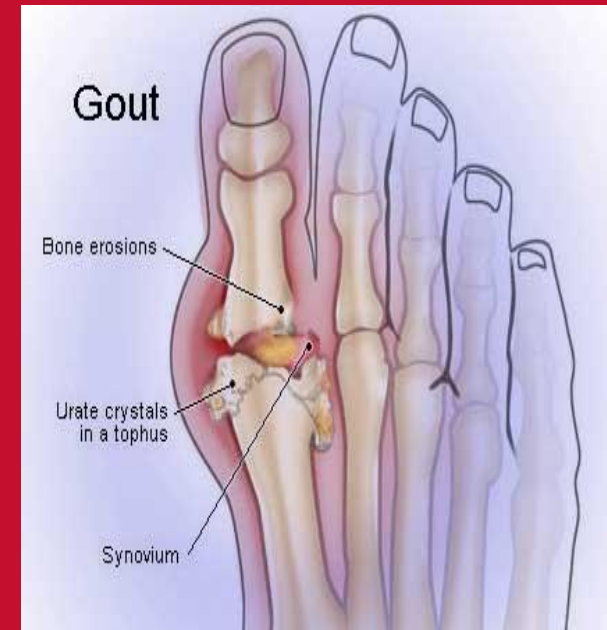


# Ankylosing Spondylitis

- Inflammatory arthritis of spine
- Causing pain and stiffness in the back and bent posture
- Affects 1% of Canadian adults
- Exercise is cornerstone of AS management

# Gout

- Caused by too much uric acid in the body
- Most often affects the big toe
- 3% of Canadian adults
- 4x more likely in men



# Visits to Physicians

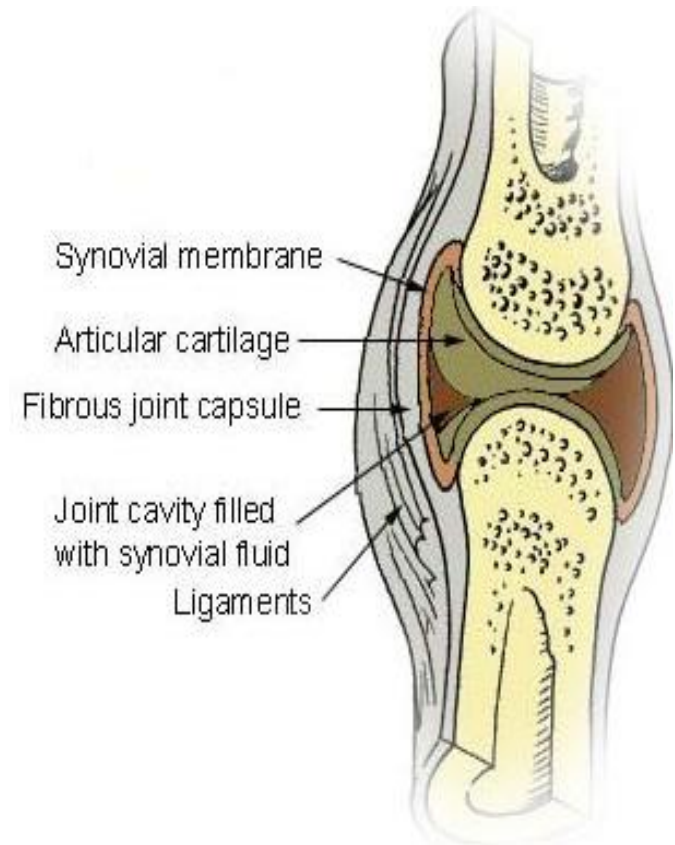
Condition	Persons per 1,000 Population	Sex Ratio (Women: Men)	Estimated Total Visits	Average Visits per Person
Arthritis & Other Related Conditions	162.7	1.3:1	8,800,000	2.3
OA	40.7	1.6:1	2,000,000	2.1
RA	7.4	2.4:1	540,000	3.1
SLE	1.9	3.1:1	110,000	2.5
AS	1.1	1:1	40,000	1.8
Gout	5.2	0.3:1	200,000	1.6

# Osteoarthritis

- Affects 10% of Canadian adults
- General wearing down of cartilage leading to joint damage, pain and stiffness
- Treatments exist to decrease pain and improve joint mobility

# Osteoarthritis

- Joint: where two bones meet
- Articular cartilage: acts as protective cushion and allows smooth movement of bones
- Synovial membrane: produces fluid to nourish the cartilage



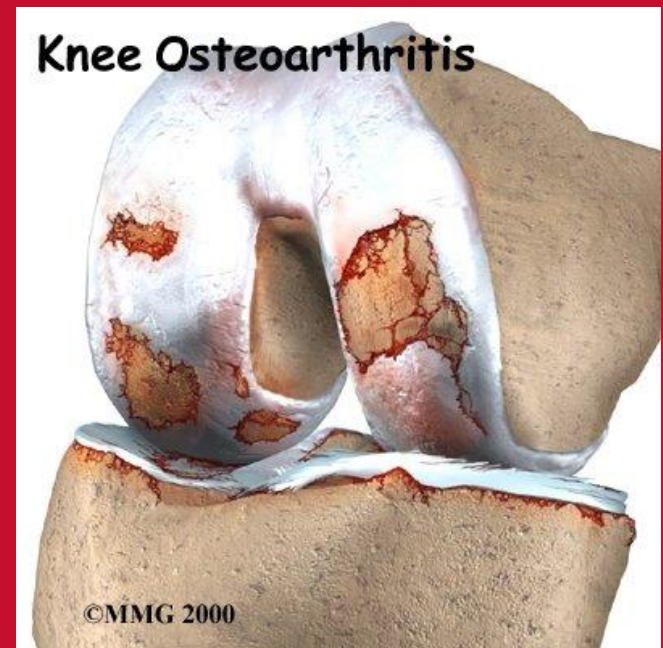
# Osteoarthritis

- Articular Cartilage
  - Becomes rough and fragmented
  - Leads to sclerosis and narrow joint space
- Synovial Membrane
  - Becomes inflamed and thickened
  - Lead to osteophytes which leads to wearing away of cartilage

# Osteoarthritis

## Joints affected:

- End/Middle joints of fingers
- Joint at base of the thumb
- Hips
- Knees
- Joints at base of the big toe
- Neck (cervical spine)
- Low back (lumbar spine)





# Types of Osteoarthritis

## Primary OA

- Wear and tear aspect of the disease
- Intrinsic defect, excessive weight, occupational overuse

## Secondary OA

- Defects in joint structure
- Disease/inflammation

# Osteoarthritis Symptoms

- Aching/ throbbing pain
- Varied pain – correlation with weather and atmospheric pressure
- Pain and discomfort gets worse as the day progresses
- Pain is usually relieved with rest

# Osteoarthritis Symptoms

- Movement of joints can sometimes cause a creaking sound
- Stiffness and pain results in joints being used less and surrounding muscles being weakened
- Problems with gait lead to sedentary lifestyle
- Diagnosed by x-rays

# Medical Management of OA

## Non-Prescription Medicine

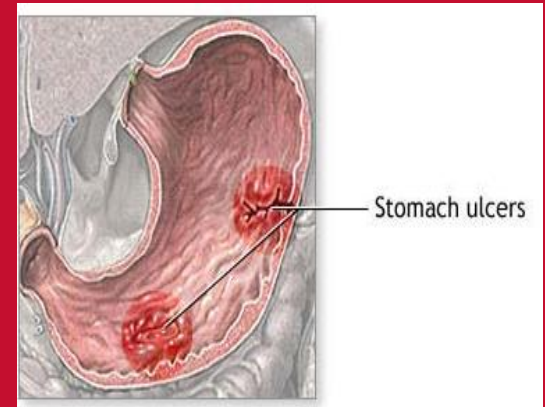
- Acetaminophen (Tylenol)
  - First choice for treating OA
  - Max dose 4000mg
  - No Anti-Inflammatory effects
- Ibuprofen and ASA (Aspirin)
  - Analgesic and Anti-inflammatory
  - Max dose 800mg daily



# Medical Management of OA

## Prescription Medicine

- Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)
  - ↓ pain, swelling of joints, stiffness
  - They do not prevent further joint damage
  - Taken on an as needed basis
  - Have some serious side effects



# Medical Management of OA

## Prescription Medicine

- COX-2 selective inhibitors (COXIBs)
  - Target enzyme causing inflammation and pain
  - Custom designed to reduce risks of NSAIDS
- Topical Medications
  - Over-the counter creams and rubs
  - Active ingredient to relieve pain (NSAIDS)
  - Less side effects than when taken orally

# Medical Management of OA

## Prescription Medicine

- Narcotic Analgesics
  - Powerful medication to enhance pain control
  - After 3 months, may ↓ joint pain and stiffness and ↑ overall function
- Hyaluronan Injections (Viscosupplementation)
  - Aids synovial fluid in regaining ability to lubricate joint cartilage and allow joint to absorb mechanical shock

# Medical Management of OA

## Prescription Medicine

- Corticosteroid Injections
  - Injected into affected area to provide instant relief
  - Limit frequency to 3-4 times/year for each joint
  - Can damage the cartilage and weaken the bone resulting in further joint problems





# Medical Management of OA

## Complementary Therapy

- Glucosamine & Chondroitin
  - Components of articular cartilage
- Surgery
  - Arthroscopy
  - Osteotomy
  - Total joint replacement/ Arthroplasty

## Teamwork Approach

- HCPs not adequately prepared to design & prescribe exercise programs
- Emergence of team concept
- Goal: alleviate concerns of patients (e.g RA stats)



# Benefits of Physical Activity

Increase	Decrease
Body composition	Falls
Strength	Functional dependency
Longevity	Arthritis Pain
Physiologic reserve	Risk for diabetes
	Risk for coronary arteries

# Exercise Program

- Goals
  - ↑ range of motion by normalizing gait
  - ↑ muscle strength around affected joints
  - ↑ QOL by being able to perform ADLs
  - ↓ pain
- Not possible to prevent onset but can change factors that can be partially controlled
- Should cater to individual needs

# General Principles for the treatment of Osteoarthritis

1. Both strengthening and aerobic exercise can reduce pain and improve function and health status in patients with knee and hip osteoarthritis.
2. There are few contraindications to the prescription of strengthening or aerobic exercise in patients with hip or knee osteoarthritis.
3. Prescription of both general (aerobic fitness training) and local (strengthening) exercises is an essential, core aspect of management for every patient with hip or knee osteoarthritis.

# General Principles for the treatment of Osteoarthritis

4. Exercise therapy for osteoarthritis of the hip and knee should be individualized and patient-centered taking into account factors such as age, co-morbidity and overall mobility.
5. To be effective, exercise programs should include advice with education to promote a positive lifestyle change with an increase in physical activity.
6. Group exercise and home exercise are equally effective and patient preference should be considered.

# General Principles for the treatment of Osteoarthritis

7. Adherence is the principle predictor of long-term outcome from exercise in patients with knee or hip osteoarthritis.
8. Strategies to improve and maintain adherence should be adopted, e.g. long-term monitoring/review and inclusion of spouse/family in exercise.
9. The effectiveness of exercise is independent of the presence or severity of radiographic findings

# General Principles for the treatment of Osteoarthritis

10. Improvements in muscle strength and proprioception gained from exercise programs may reduce the progression of hip and knee OA.

NB. It should be noted that the above recommendations are based on both rigorous scientific research and expert opinion (Roddy et al, 2005 #17 68-70)



# Physical Activity Prescription

- Primary prevention is key
- OA not necessarily part of the aging process
- Risk factors: obesity, muscle weakness, joint injury, occupational stress



# Physical Activity Prescription

## Obesity

- Healthy body weight is key

## Muscle Weakness

- Muscular strengthening is a strong preventer

## Joint Injury

- Acute injuries are risk factors

## Occupational Stresses

- Those requiring kneeling and squatting will ↑ risk

# Physical Activity Prescription

*“Failure to recommend exercise to our patients is a professional negligence” – Hurley*

The entire lower kinetic chain should be examined to better determine the underlying biomechanical mechanisms that may be contributing to the presence of particular symptoms

*Analogy : a car's steering alignment*



# Physical Activity Prescription

## Aerobic/Strengthening Exercises

- ↓ ADL disability
- ↓ pain and disability
- Aerobic → long term; Strengthening → short term

## Resistance training

- Developing fitness and health
- Prevention/rehabilitation of orthopedic injuries

# Physical Activity Prescription

## Manual Physical Therapy

- Combined with exercise programs
- ↑ pain, stiffness, function
- ↓ need for surgical intervention
- Less likely to be taking medication after one year vs. home-based



# Physical Activity Prescription

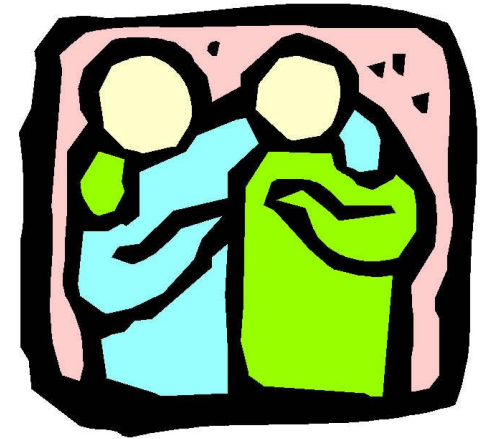
## Recommended Program

- Single set programs up to 15 repetitions
- Performed a min of two days per week
- 8-10 different exercises that train major muscle groups
- Contribute to overall fitness

# Physical Activity Prescription

## Adherence

- Organized exercise
- Efficacy/outcome expectations
- Motivation from social support
- Experience with exercise task



# Physical Activity Prescription

## Summary of General Principles

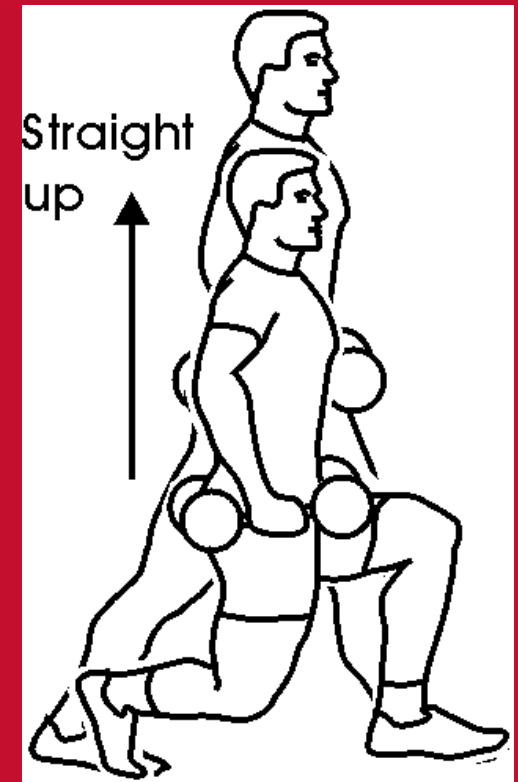
1. Strengthening and aerobic exercises can reduce pain and improve function
2. Few contraindications to the prescriptions of strengthening or aerobic exercise in patients with OA



# Physical Activity Prescription

## Summary of General Principles

3. Prescription of both types of exercises is an essential aspect of OA
4. Exercise therapy for OA should be individualized



# Physical Activity Prescription

## Summary of General Principles

5. Should include advice and education to promote a shift to a more physically active lifestyle
6. Group exercises and home exercises are equally effective

# Physical Activity Prescription

## Summary of General Principles

7. Adherence is principle predictor of long-term outcome
8. Strategies to improve adherence should be adopted e.g family in exercise
9. Improvement in muscle strength may reduce progression of OA

# Acknowledgements

Gratitude is expressed to

ALCOA-MB

The Arthritis Society of Canada (Manitoba branch)

for financial support for this work.

# References

Taylor, Taryn-Lise, Catherine E. Casey, Edward Todd Taylor, and Albert W. Taylor. "Aging, Physical Activity and, Arthritis." *Arthritis Society*. Print. [References of 100+ sources]

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