Setting the Stage: What is OA?
Disclosure

- None
Objectives

• What is OA?
  – OA as Common Chronic Condition
  – OA as a ‘disease’ (joint structure)
  – OA as an ‘illness’ (impact on the person)

• What causes of OA?
• Globally, aging populations & growing prevalence of obesity → increased population risk for hypertension, dyslipidemia, diabetes, cardiovascular disease… … & osteoarthritis (OA)

OA is the fastest growing major health condition
Major Causes of Death and Disability

(% Disability Adjusted Life Years Lost)

- 33% average ↑ 1990 – 2010
- 45% ↑ 1990 – 2010

- Cardiovascular / circulatory
- All neoplasms
- Mental/behavioural
- MSK

Back pain
Neck pain
OA (83% knee OA)

Lancet 15 December 2012
OA is the most common arthritis
three-quarters of the people who have arthritis have OA

Living with arthritis

- 2010 – 1 in 8
- By 2040 1 in 3

- Women > men
- Knee OA most likely to lead to disability
- Hand OA most common disease affecting hand function in elderly
- 95% hip/knee replacements for OA
Co-Existent Medical Conditions

- 90% of people 65+ years with OA have ≥ 1 other chronic condition (common risk factors: aging, obesity)
  - Heart disease
  - Diabetes
  - High blood pressure

- Comorbidity in OA is a *major* barrier to OA care
  - Competing demands
  - Contraindications to OA therapies

Nieves Plaza et al J Clin Rheum 2013
K Magnusson et al Arthritis Care & Res 2014
Patterns of OA

• Localized OA
  – Hands & feet
  – Knee
  – Hip
  – Neck
  – Lumbar spine

• Generalized OA
  – 3+ joint groups

Osteoarthritis is...

Characterized by thinning and destruction of the cartilage with loss of joint space & sub-chondral bony changes

Symptomatic OA

Symptoms worse with more severe radiographic OA but...association between radiographic changes and symptoms imperfect
OA: The Disease

ALL joint tissues are involved
Our Vision

Improve the lives of people living with Arthritis

Rheumatology Week

2011

Marginal osteophytes

Joint space narrowing

Subchondral sclerosis

Marginal osteophytes
Physical Examination in OA

- Joint line tenderness
- Bony enlargement
- Crepitus
- Reduced range of motion
- Inflammation (swelling, redness, warmth, tenderness)
- Mal-alignment
Assessment of *Structural OA*

- **PLAIN X-RAY** detects cartilage loss by inference (joint space narrowing), which occurs in *late disease*
  - Like using stroke to diagnose hypertension

- **MRI** assesses ALL joint tissues, but still working out what changes are meaningful (relate to symptoms, progression)
  - e.g. meniscal tears common & don’t differentiate people with/without pain
  - Time & Cost
But *symptoms* drive OA burden

(OA: the illness)
Painful OA

- Painful OA...
  - is second most frequent reason for visit to physician
  - accounts for most anti-inflammatory drug use
  - is the #1 reason why people have joint replacement surgery
Usual Course of Pain in OA

- **Early OA**
  - Predictable sharp or other pain with trigger (usually an activity) that eventually limits high impact activities but has no other major effects

- **Mid OA**
  - Predictable pain increasingly associated with unpredictable locking, other knee symptoms, pain more constant with time – starts to affect walking and stairs

- **Late OA**
  - Constant aching/dull pain with short episodes (unpredictable) of very sharp pain that leaves them exhausted; significant curtailing of all activities

Hawker et al, Osteoarthritis & Cartilage 2006
OA Pain Cascade

Disability

Participation restrictions*

Depressed mood

Fatigue

Pain

Sleep

Hawker et al, Arthritis Care Res 2011

*Wilkie R et al, Arthritis Care & Res 2013
OA impacts mobility

Appel et al, JAMA. 2003
Cheraghi-Sohi Arthritis Care & Res 2013
**Difficulty Walking Reduces Survival**

- Population based cohort 35+ years with symptomatic hip/knee OA recruited 1994-5 from 40 English general practices (n=2,703)
- Examined survival status & cause of death to February 2009 using data from National Statistics
- Controlling for age, sex, diabetes, cancer, CVD, walking disability (1.48, 1.17 to 1.86) predicted ↑ all-cause death (mainly from CVD causes)

*Neusch et al BMJ 2011*
Most Distressing OA Pain Features

- Intensity (*severity*)
- Intensity (*quality*)
- Affect on sleep
- Impact on mood
  - frustration (inability to do things), worry (e.g. for the future)
- Unpredictability
- Impact on function (*ADLs, work & leisure activities*)

What causes OA?
Current Understanding of OA

- A progressive disease of synovial joints that represents **failed repair of joint damage** resulting from **stresses** that may be initiated by an abnormality in ANY of the joint tissues (articular cartilage, subchondral bone, ligments, menisci, periarticular muscles, peripheral nerves, synovium) → **breakdown of cartilage and bone**

2009 OARSI Task Force on Defining OA
OUR VISION

IMPROVE THE LIVES OF PEOPLE LIVING WITH ARTHRITIS

OA Pathogenesis

Joint Factors
(joint loading)

Systemic Factors

inflammation

Matrix destruction
Aberrant repair response
Mechanical failure

Joint Destruction
Concept of “Metabolic OA”

Conde J et al Arthritis 2011
Personalizing OA Care

*linking treatment to etiology*

**Biomechanics**
- Weight loss
- Insoles, Braces
- Canes, Walker
- Exercise (resistance, aerobic, neuromuscular training)

**Systemic Factors**

Local treatments
- Topical therapies
- Intra-articular injections

Systemic treatments
- Weight loss
- Exercise
- Analgesics
- NSAIDs

Self-management strategies, including education
Summary

• OA is the most common arthritis
  – Most people with OA also have other common chronic conditions

• Paradigm shift: from cartilage ‘wear and tear’ to complex pathogenesis where *ALL joint tissues* involved
  – Multiple causes with one final common pathway rather than a single condition
  – Opportunities for personalized approach to prevention (weight, injury prevention) and treatment (systemic, biomechanical approaches)

• Symptoms drive care seeking behaviour
  – Better assessment of symptoms provide opportunities for targeted therapies
Thank you...